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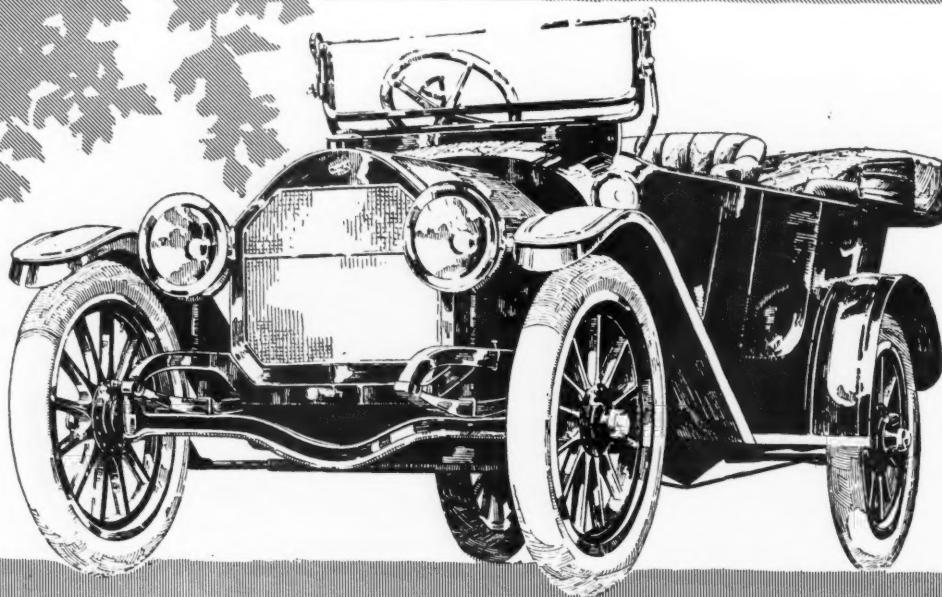
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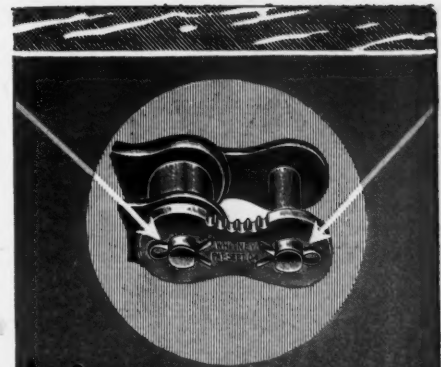
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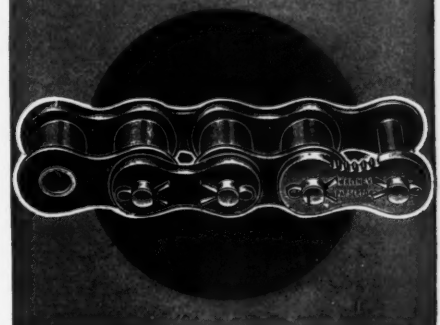
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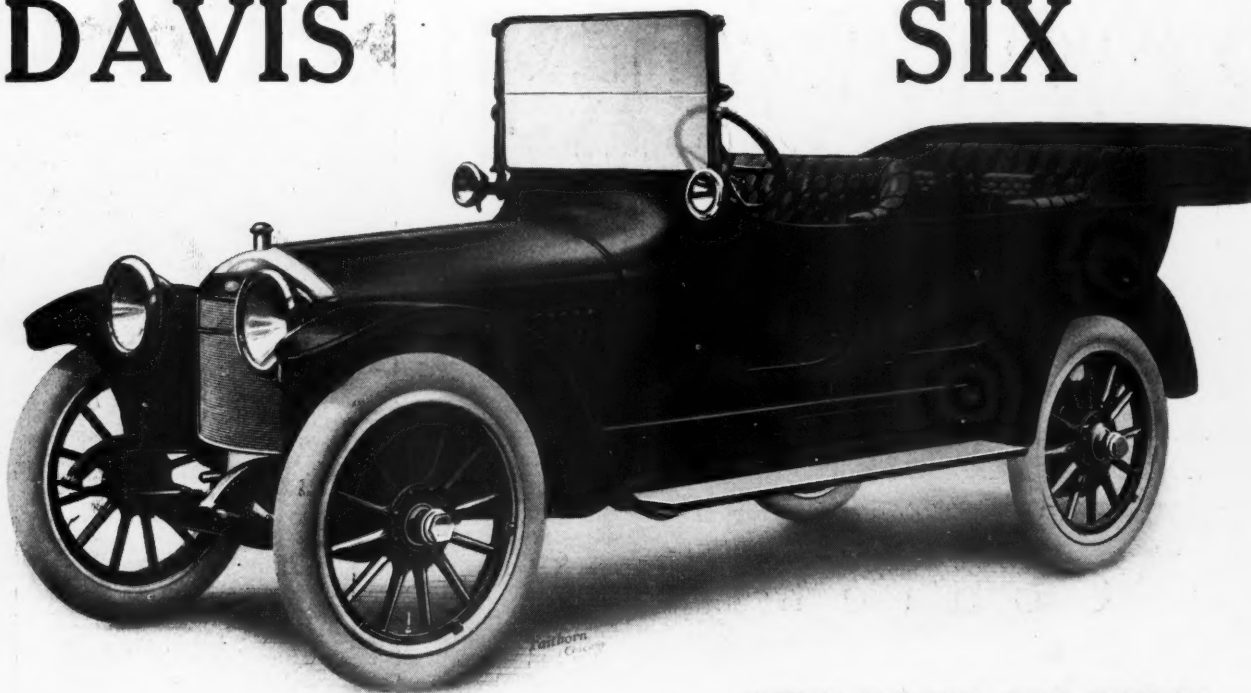
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# MOTOR AGE



## In the Land of Pueblo and Cliff Dweller Taos, America's Most Ancient City

SCENE AT TAOS DURING THE SAN JERONIMO FESTIVAL

By John P. Dods

Photographs by N. Lazarnick, New York

UNDER an almost cloudless sky of restful turquoise we stood, drab, dusty, almost disrespectful intruders in an ancient town of many hues and unsolved mysteries. The motor car in which we sat seemed an irreverent vehicle of insinuation, an anachronism that hummed a paean of progress and strife among a primitive people who are content to remain in the prehistoric tracks of their ancestors and live in peace.

### A Background of Mountains

It was the glorious morning of a late September day. The air was clear and fresh and good to breathe. We looked, as through a great kaleidoscope, upon a continually changing panorama.

Breaking the monotony of the clear-cut horizon line, towered the Sangre de Cristo mountains, their highest peaks capped with snow, their massive sides splashed with the brilliant yellow of the cottonwoods, the regal gold of the aspens, the contrasting green of the pines and spruces. The most picturesque of all the

**EDITOR'S Note**—Less than 3 months ago—on the morning of September 28 to be exact—John P. Dods, western representative of the *Automobile Blue Book Co.*; J. A. Harris, advertising manager of the *White Co.*; and N. Lazarnick, the New York photographer, set out from Pueblo, Colo., in a White six-cylinder car on a journey of motoring exploration through a territory discovered but unknown, to blaze a trail for the motorist through the mystic, historic, scenic southwest. This article, the first of a series written by the chronicler of the pathfinding party, starts the account of their 4-weeks' tour and will give to the motor car owners of the United States for the first time an idea of the touring possibilities of the unappreciated southwest. Other stories will follow weekly that the readers of *Motor Age* may follow the modern adventurers through the canyons, across the desert and over the mountains of this attractive region.

picturesque Rocky mountain ranges was in festival attire.

With the aid of powerful field glasses, allied with some imagination, one could see the source of the bold little stream which centuries before rippled an arrogant challenge to the mighty rocks and patiently fought its way, inch by inch, down the mountain side to the fertile plain on which we stood. Like a Goliath-conquering David, it rolled out a song of triumph as it tumbled out of Glorietta canyon to divide the ancient town into two parts, the north and the south pueblo.

### Two Houses of Antiquity

On either side of this audacious creek, two terraced houses of countless generations, brownish cream in color and severe and bald in outline, successfully challenged the resplendent mountains for our attention. They seemed like two piles of monster blocks, abandoned by some Titan boy who had tired of his play. Each stood a monument to the fame of some prehistoric builder, an artist who was a for-

bear of the modern cubist no doubt; five tiers of continuous rectangular adobe dwellings, stretching for a city block in length and piled one tier upon another; a perfectly graduated pyramid of houses from which curled the smoke of a hundred hearth-fires; an aboriginal apartment house with holes in the roof instead of doors for entrances and crude wooden ladders providing a means of ascent or descent; suite after suite of two or three rooms each to which the light is admitted through small square windows cut in the thick adobe walls.

#### Indian, American and Mexican

On the several tiers of the communal houses were assembled the residents of this aeon-old town, the men wrapped to the eyes in white sheets or blankets and with bands of red cloth about their unbarbered, unhatted heads; the women draped either in white sheets or black shawls and their feet incased in fascinating moccasins of pure white buckskin extending almost to the knees. Here too were gathered the guests of the town—for it was a fiesta day—Indians from the neighboring pueblos along the Rio Grande to the south and Apaches and Navajos from their reservations across the great divide, and a crowd of sightseers, American tourist and health-seeker, New Mexico rancher and trader, holiday-loving Mexican with his wife or "querida" blatantly gay in the brightest of calicos.

In the broad plaza at the front of the north pueblo was the overflow, scores of visiting Indians and curious Americans and Mexicans who doubtlessly had sought vantage points on the crowded terraced houses with only disappointment as a reward for their futile climb. The throng moved slowly and care-free, broken up into groups of mobile blackness that was relieved occasionally by the gorgeous blanket of a phlegmatic Navajo,



Map showing points visited by the author on his trip through the southwest, a region that should be visited soon before it is spoiled by commercialism

the beaded jacket of a stolid Apache or the prized gold-braided sombrero of a Mexican dandy. Venders of luscious melons, grapes and peaches, of Indian blankets, pottery and baskets shouted their tempting wares in dulcet Spanish or broken English.

Across the singing stream and on the outskirts of the south pueblo stood the high-wheeled carts, and canvas-covered wagons of the visiting people, the horses munching on the scattered tufts of grass and sniffing knowingly at the occasional outcroppings of bitter sage brush.

We had halted at the side of a white-washed mission church. With cross raised amid all this barbaric rejoicing and color, it stood an unostentatious memorial to the devout Franciscan martyrs who over 3 centuries before marched with the avacious conquistadors of Coronado from old Mexico in search of another Peru in the desert wastes of the southwest. Directly opposite and partially hidden by a squat adobe dwelling were the blackened ruins of an old mission, built by the cowed padres and hospitable Indians in the sixteenth century and destroyed 3 score and 6 years ago in the uprising of the Pueblos after American occupation. The walls are charred and crumbling, pitted with cannon ball and bullet.

#### Taos, Our Oldest Town

We were in Taos, the first objective point in our journey through the unknown and unappreciated southwest; Taos, the oldest town in the United States; Taos, perhaps the most ancient city in all the world; Taos, a wonderful conglomerate of bits of Arabia, Spain and Switzerland transplanted in this country only 73 miles northeast of historic Santa Fe.

Just how old this town of terraced houses really is, no one knows. Archeologists and anthropologists have advanced learned theories and attempted to estimate its age only to curse their inability to arrive at anything approaching a definite conclusion. That it is older than Jamestown and Plymouth, we are certain. Long before Captain John Smith dreamed of a

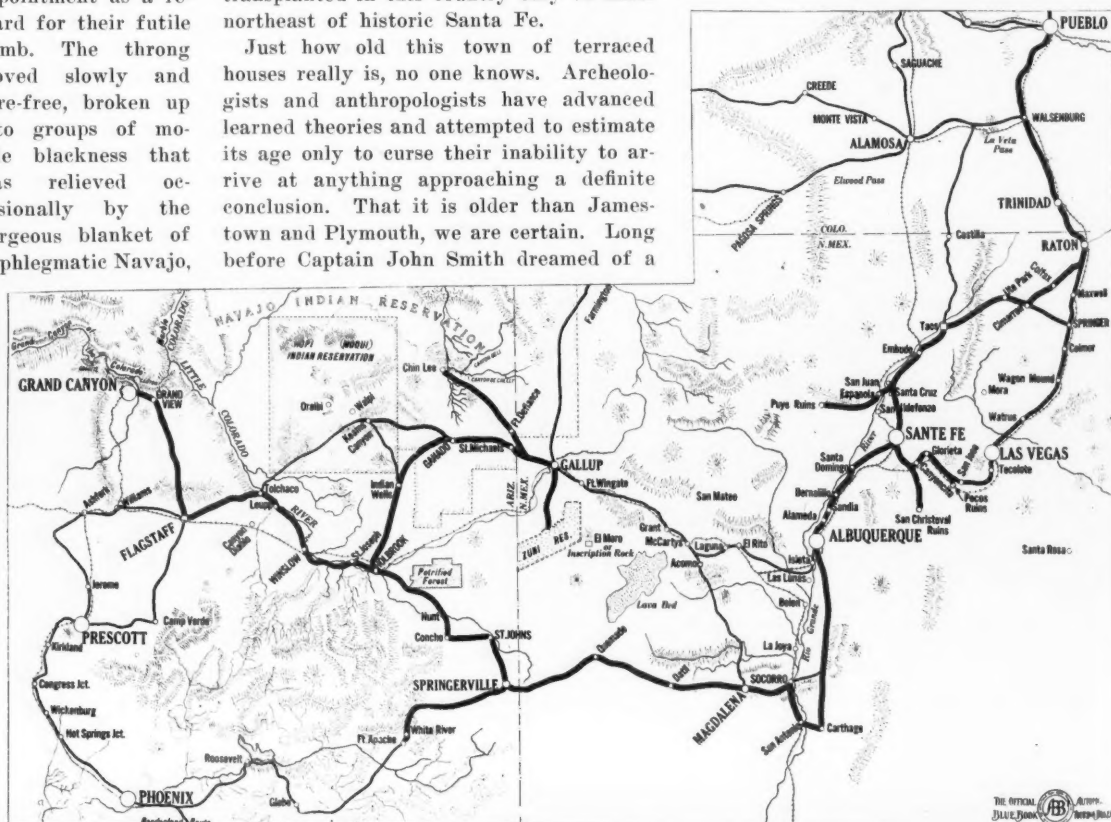
new world settlement, the women of Taos ground their meal in the very metates you see today on the floors of the communal dwellings and baked their bread in the dome-shaped ovens that are scattered on the ground in the vicinity of the pueblos. Long before the heaven-sent winds filled the sails of the Mayflowers and drove the Pilgrims across the Atlantic to their haven of religious freedom, the men of Taos worshipped the earth god and water spirit in the same underground shrines or estufas in which their descendants perform secret rites to this day.

#### When Was Taos Built?

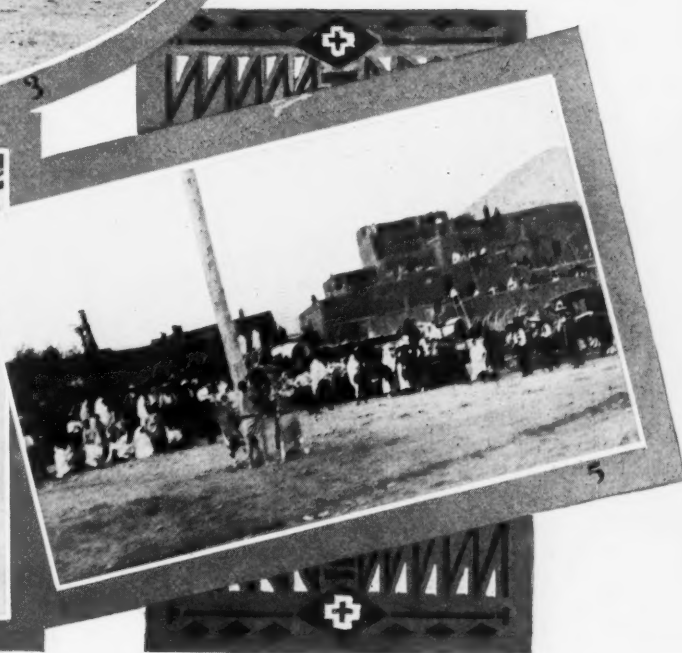
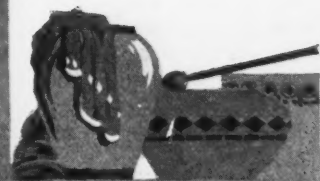
When the pueblos of Taos were built is only a matter for imaginative calculation. Perhaps when the 100,000 slaves of Cheops were dragging stone from the Turah quarries of Egypt for the great pyramid, contemporaneous artisans in Taos were baking adobe bricks in the sun and rearing two dwellings that would withstand the ravages of countless generations. For all we know, the antiquities of Babylon are no older than the wonderfully preserved "houses of their fathers" in which the modern inhabitants of Taos live.

Raze the whitewashed church with its cross, tear down the black walls of the old mission, wipe out the small adobe houses scattered sporadically over the plain and you have before you the Taos of 1540, the pueblo which the chroniclers of the Coronado expedition knew as Braba and to which the mailed conquistadors were guided by the Indians of the seven villages of Cibola.

The written history of Taos covers less than 4 centuries, 376 years to be exact.







1—Indian runners lining up for the dance after foot race at Taos. 2—The start of the foot race under the shrine of cottonwoods. 3—Indians leaving the Catholic mission to start San Jeronimo festival. 4—Chiffonettes, or delight-makers, crowding laughs into an afternoon of festa. 5—Pueblo clowns gathered about the greased pole and viewing lofty prizes

White men first marvelled at the terraced houses in 1535 when Cabeza de Vaca and three companions, survivors of the shipwrecked Narvaez expedition, wandered across the continent from Florida and after being held as captives by the Indians at Taos and other pueblos to the south for 8 years, finally reached old Mexico with reports of rich cities and vast undiscovered territory. Next, in 1539, came the friar, Fray Marcos de Niza, with two lay brothers as escorts and Estevanico, Cabeza de Vaca's negro servant, as a guide. The friar set out from the land of the Aztecs to conquer with the cross only to return with the information that swords were needed. The following year Francisco Vasquez Coronado, in command of 300 soldiers in burnished mail, started on his march of conquest that the wealth of the king of Spain might be increased and the boundaries of his majesty's new domain extended to the north seas. It proved a march of travail and disappointment. Into the great unknown of desert and mountain the conquistadors blindly plunged to be crazed by thirst and felled by fever, to subdue a peaceful people and sack terraced towns that had little precious loot to yield up.

#### End of Santa Fe Trail

At the dawn of the nineteenth century, before Santa Fe became the terminus of the trail for the American traders from Kaskaskia and St. Louis, the American town of Taos, founded by the Spaniards 3 miles south of the Indian pueblo, was the end of the primitive highway over which Kit Carson, Jim Bridger, Colonel Ashley and other famous frontiersmen rode to barter inexpensive trinkets, tobacco and firewater for Indian blankets, beaver and buffalo fur and silver jewelry hammered out of Spanish bullion and set with turquoise. Among the one-story dwellings of adobe the abandoned house of Kit Carson stands and the school boys' hero of our fathers' youth is buried in the little cemetery at the northern edge of the town. Occupying almost the entire east side of

the plaza is the old Columbian hotel. It was once a mission, one of the first established by the Spaniards in this country, but in the early days of the last century the padre moved out and an inn keeper took possession. The trader, bull-whacker and scout demanded food and drink, not prayers and confessions.

The past has more claims upon Taos



*Cimarron canyon is flanked by polychromatic palisades, strata after strata of rock standing up straight on end*

than the present. Today it is only a curiosity, the most unAmerican thing in America, but when Louisiana, extending from the Mississippi to the Pacific, was the pawn of an Argon, Taos was a watch tower on the frontier, a trading post where rugged frontiersmen built colossal fortunes. What Montreal and Quebec were to French Canada and Boston and Salem to New England, so Taos and Santa Fe were to the Spanish southwest.

We had to come to Taos to witness the San Jeronimo festival, an annual barbaric fiesta of dancing, foot racing and clowning that falls on September 30. We had ridden for 2 days over the picturesque highways of Colorado and New Mexico. On our first day's trip, from Pueblo to Trinidad, the Spanish peaks ever were in view, monster cones of timber, rock and snow that seem to puncture the loftiest clouds and stand out in sharp contrast to the more rounded mountains to the west.

Natural wonders new to us and varying

road conditions made the second day's journey of 120 miles anything but monotonous. Immediately upon leaving Trinidad, we commenced a long gradual climb through a color-splashed valley that is known geographically as Raton canyon but which is not much of a canyon if one expects precipitous cliffs and a narrow sharp road. Starting the ascent to the top of Raton pass, we crossed the state line into New Mexico at an altitude of 8,790 feet and driving over a road that follows a winding and slightly rolling ridge, we commenced our descent about 22 miles from Trinidad. For 17 miles we rode on an almost level plain to strike the mountains again at Cimarron, necessitating a journey through Cimarron canyon over a narrow rocky trail. Although not a box canyon, the cliffs in some places rise to a height of 800 and 900 feet and for the last 7 miles the road is flanked by polychromatic palisades, strata after strata of brilliantly colored rock standing straight upon end with sharp, ragged edges along the skyline.

We next crossed a broad valley, too high for agriculture but an excellent grazing ground as was evidenced by the herds of cattle which we saw, to climb to the top of Taos pass through the thick timber of a national forest reserve and cross the Sangre de Cristo mountains at an altitude of 9,000 feet. Coasting for 13 miles on an easy down grade, we came to the valley of the Rio Grande just at sunset. Fifty miles to the west the continental divide was aflame with light which gradually lost its fiery redness to bathe the mountains in a restful primrose afterglow. The broad road suddenly narrowed to a street the width of an alley. A corner turned and we were in the town of Taos.

#### Waiting for the Festival

Although the festival was not to start until the next morning, the plaza was crowded with visitors, the majority of whom were Mexicans and the Indians of three nations, the Pueblo, the Navajo and



the Apache. From the saloons came the ribald laughter of merry-makers. Mexican revellers thronged the dance halls and whirled and quadrilled to the music of fiddle and guitar. At the Columbian hotel late comers, seeking accommodations, were turned away.

#### Mass Before Barbaric Rites

Dancers and drinkers, people who had slept in beds and people who had dozed in chairs were abroad early the next morning for the 3-mile drive to the pueblo where the festival was scheduled to begin at 9 o'clock. Scarcely had we parked our car close to the edge of the creek when a bell tolled and a procession of Indians, in black and white sheets or blankets, filed out of the mission doors from high mass for in all Pueblo festivals the native rites are proceeded by the catholic services. The race course, part of which extended in front of the north pueblo where a shrine of cottonwoods had been erected on the top of the lower tier of houses, was the destination of the bronzed aborigines.

We climbed to the summit of the north pueblo to get a better view of the foot race. Off to the left were two-score Indians lined up on either side, paired off like dancers in a Virginia reel and with a 6-foot chief at one end of the line giving his final instructions. The runners were stripped except for a gaudy breech-cloth. Their copper-colored bodies were painted in the most fantastic of designs. A few wore an elaborate feather head-dress. Their feet were bare. In the shadows of the south pueblo was a similar group, just as nude, just as ingeniously decorated and listening to the advice of a white-blanketed leader. To the east stretched a quarter-mile straightaway course which had been swept and cleaned by natives every morning for a week until it seemed as smooth and fast as a collegiate track rolled and raked for the spiked shoes of a Ted Meredith or a John Paul Jones.

Without the slightest warning there arose a murmur of expectancy. The race



*Kit Carson's house and grave at the American town of Taos*

was about to start. The spectators formed in two lines, one close to the north pueblo and the other parallel to it and about 20 feet distant. The runners representing the two pueblos took their places, half of each side going to the east end of the course and the other half forming in a semicircle just below the shrine of cottonwood. A referee, commanding of height and impressive in his white sheet, darted out of the crowd. Without a signal, without an outcry, two runners left their marks. The race was on.

#### Race of Painted Mercuries

Starting from the east end of the course, the painted Mercuries ran as only Indians can run, gracefully and without assuming a sprinter's face. In our collegiate relay races, the finishing runner must touch the hand of the man who takes up the next lap but with the Indians, just as soon as a runner crosses the line, his teammate leaves his mark, starting from a few feet back so that both runners are under full speed when crossing the line. The referee watches that none start ahead of time. As each man moves up to his place to relieve the runner, he is attended by a trainer who armed with a little feather duster, follows his protegee and tickles his

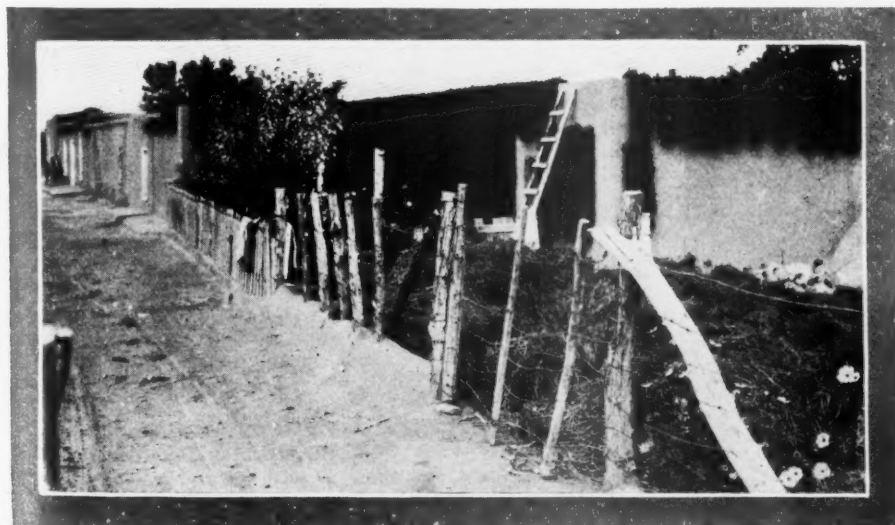
legs, keeping the runner up on his toes as it were.

Almost from the start, the south pueblo runners took a commanding lead and although at one time the fleet representatives of the north pueblo showed a burst of speed that reduced the lead to only a few feet for several relays, the south finally shook off the challenge and won by a comfortable margin. We learned from spectators of past races that the north pueblo had as persistent jinx as that of the St. Louis baseball team in the annual battles for the American league pennant, that only at long intervals had the north runners been triumphant.

#### Dancers Men of Endurance

The race over, the runners of both sides formed in two lines and facing each other, began a dance to the monotonous beat of a native drum, a dance that lasted until every house in which anyone having the name of Jeronimo lived had been visited. Then the dancers separated on the run, headed for their several estufas and scrambled down the ladders which lead to the underground houses of worship to perform sacred rites of which the white man knows little if anything. The estufas at Taos are entirely subterranean, the only outside identification being a circle of stones or an adobe wall around the top of a ladder.

While wondering what sort of barbaric ceremony was being performed in the underground shrines, while waiting for the runners and dancers to reappear, we had an excellent opportunity to inspect the terraced houses. Unlike practically all the other pueblos of the southwest—unlike Laguna, Acoma, Zuni and the Hopi villages which are located on mesas or high



*Red peppers literally line the valley from end to end*



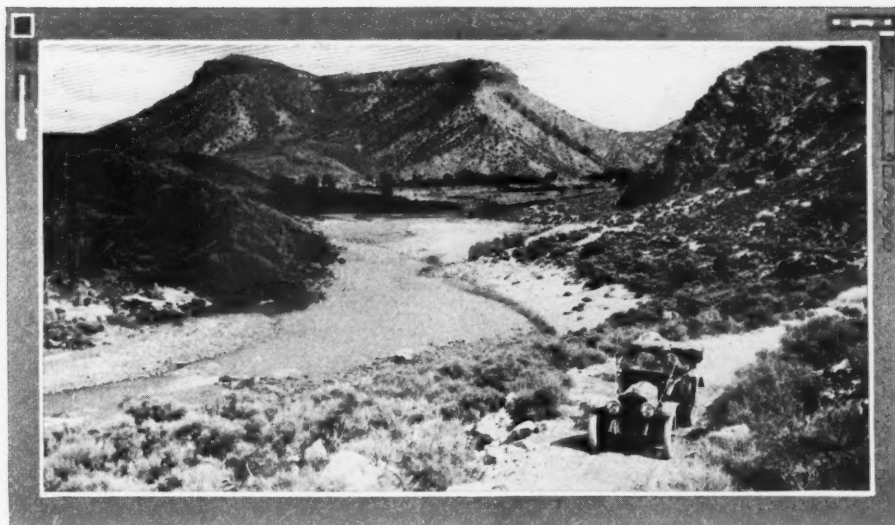
ground overlooking the surrounding country — Taos pueblo lies in the very lap of a small valley. It also is distinctive in that the entire population of about 800 persons live in the two dwellings. When you consider that each family will average at least three rooms, you can get an idea of the enormous size of these aboriginal apartment houses.

We also had time to run down to Ranchos de Taos, the distinctly Mexican settlement 3 miles south of the American town. Here we found a group of adobe houses that are almost as quaint and picturesque as the Indian pueblo itself and an old mission church, dating back to 1772 and still in use and good repair, with a hand-carved altar that would be a possession coveted and prized by the most fastidious collector of the rarest of antiquities. The church stands in the center of a plaza and resembles more a fortress than a house of worship. There are huge slanting abutments that rise from the ground at each corner to the highest point of the ancient edifice with a massive rounded surface in between and no windows to break its smoothness.

#### Antics of the Chiffonettes

A drive over the cottonwood-canopied road back to the American town, a hurried lunch at the Columbian hotel and we returned to the Indian pueblo to witness the antics of the chiffonettes or delight-makers, descendants of a family of ancient clowns that antedate Harlequin and Pantaloon of the Italian pantomime. Their naked bodies stripped and smeared with black and white paint and their heads crowned with garlands of corn husks, these crude farceurs bounded yelping into the plaza on all fours to bend and twist in a series of impromptu contortions; to steal melons from wagons and dance about their ill-gotten gains; to swoop down upon a screaming child, pick him up and drop him in the creek; to blow horns while standing upon their heads.

As a climax to their antics, these buffoons climbed a greased pole at the top of which had been hung some vegetables and fruit and a dead sheep. Observing an ancient custom, they first gathered around the foot of the pole and attempted to bring down the prizes with straw arrows shot from small bows. Unsuccessful in their marksmanship—they sent the play darts nearly 50 feet in the air in a high wind—and their ammunition exhausted, they wisely



*A typical scene in the Rio Grande valley between Taos and Santa Fe*

shook their tasselled heads in deciding that such attempts were futile and each tried to climb the pole. Only one succeeded in reaching the top. A rope was tossed up to him. He threw it over a cross-arm and let down the various prizes. The largest clown, who acted as referee of the foot race in the morning, took hold of the lower end of the rope and jerked the prizes up and down while his fellow jesters leaped frantically for the booty. When the last prize had been snatched, the buffoons slunk away to their estufa and the San Jeronimo festival was over.

#### Kodak Fiends Not Welcome

The motor pilgrim is welcome at Taos until he starts to take pictures. The clicking of a camera shutter arouses the superstition of these primitive people who will give you native bread and cake, welcome you to their houses, but generally refuse to pose for photographs. Some can be bribed. Others will rush at you like maniacs when you level your camera. Before this year's festival, a film manufacturer offered \$1,500 for the moving picture privilege. The Taos chiefs refused to even

consider the proposition. We succeeded in taking only three or four pictures, some surreptitiously, others by a payment of a small amount of money.

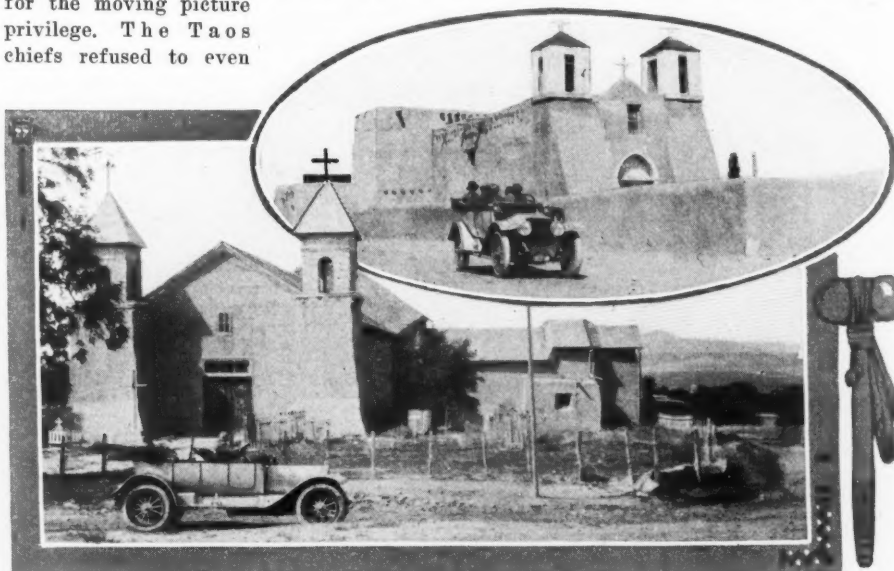
The festival at Taos concluded, we left the town of mystery unsolved and headed south for Santa Fe, the most ancient capital in all America. The ride down the Rio Grande valley to Santa Fe offers the tourist an opportunity to visit several other

pueblo villages. Although the distance is 73 miles, the trip can be made in 4½ to 5 hours easily, an especially short journey when one remembers that 3 or 4 years ago it would have been impossible to drive a motor car over this road.

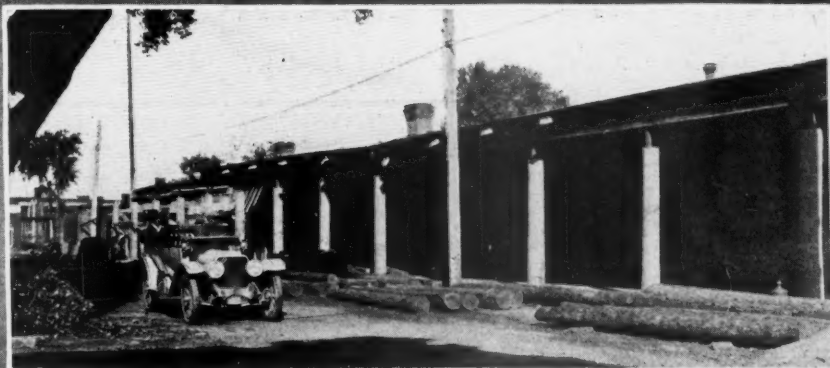
#### Good Roads in New Mexico

But the good roads contagion has spread to New Mexico. The Arroyo Hondo, 13 miles south of Taos, has been so improved that the motor car of the lowest power can negotiate it successfully. Although it has one or two pitches of a 15 per cent grade, the road surface is very good. This highway should have a great deal more improvement to put it in the shape that it should be in for the amount of motor travel that is sure to come. However, if the general tone of road improvement in the southwest is any indication, this route, like many others, will be in excellent shape in another year or two.

Like on all newly worked roads in this section of the country, one crosses an almost endless number of arroyos, most of



*Santa Cruz mission built in 1617 and in upper illustration Ranchos de Taos church erected in 1772*



*Historic Governor's Palace at Santa Fe*

them very small. We found that with a reasonable amount of care we could cross them with little difficulty. There were only one or two having any sand to speak of and the necessity for slowing up was usually on account of the sharp bumps that are nearly always found in crossing these dry washes.

In late September the trip from Taos to Santa Fe is especially picturesque because of the vast amount of red chili hung up on the walls of the adobe houses to dry. Peppers literally lined the valley from end to end, some of the dwellings being completely covered with them in thick double rows.

#### Four Decadent Pueblos

On our hurried journey from Taos we visited four of the many pueblos that are scattered through the valley of the Rio Grande. There is San Juan from whence came Popé in 1680 to lead the Indians in their successful revolt against Spanish rule. San Juan today needs another sort of liberator, a Billy Sunday, for John Barleycorn now plays the despot's role. Close by, within easy walking distance, is Santa Clara, located on a sandy dune and noted for the shiny black pottery made by its women. Five miles off the main highway to Santa Fe and in the midst of an arid, sun-scorched plain stands San Ildefonso, next to Taos the largest pueblo in this vicinity. It lies at the foot of a mesa of black lava that served as a Gibraltar in the uprising of 1680. For 9 months the Spaniards laid siege to this natural fortress. Four times the Indians resisted assaults only to be subdued on the fifth attack. Only 9 miles from Santa Fe is dirty, inert, inhospitable Tesuque where the residents splattered us with unmarketable vegetables when we attempted to take photographs.

#### Relics of Religious Fanaticism

But more interesting by far than these decadent pueblos of a vanishing people were the rude wooden crosses planted near the roadside in a heap of stones or on the summits of cactus-



*Oldest house in the United States at Santa Fe*

grown hills on the outskirts of Mexican hamlets. These crosses had been set up by the Penitentes, religious fanatics of a secret order, peons with a cross tattooed upon the forehead, chin or back who at Easter react the tragedy of the crucifixion and lash their bare backs with cactus belts or whips knotted with sharp iron to atone for sins committed during the past year. Except during Lent, they practice their secret rites by night. Neither an Indian nor a Catholic, the Penitente is a relic of the religious orders that produced a holy reign of terror in Europe during the twelfth century.

#### Historic Governor's Palace

A long, low, one-story building, made of adobe with white pine pillars and extending along one side of the plaza is the principal attraction to the tourist visiting Santa Fe. It is the sleepy, old governor's palace over which the flags of three nations have flown in the past century, the oldest government building in the United States and first occupied by a Caucasian in 1605 when Juan de Onate proudly ground his despotic heel in the adobe floor which the Indian rulers had trod one, two, perhaps 20 centuries before.

Once the governor's palace was a stage on which were acted the sordid dramas of life, tragedies of greed and lust in which the Spanish despot played the villain's role. Under the ancient beams of its ceiling the most nefarious of plots were hatched. Hidden in its secret chambers

were the iron-bound chests in which the viceroy stored his gold. Its massive walls, 6 feet in thickness, have drowned the cries of tortured victims of countless atrocities. But in its mellow old age, the governor's palace has taken on an air of respectability, an air of peace. It is now the state museum of New Mexico and the headquarters of the School of American Archeology and state historical society.

In this most ancient of American buildings is preserved the finest collection of Indian relics of the southwest in the world, mural paintings that but recently have been acknowledged by art critics as masterpieces, various cliff dwelling ruins, pottery of a civilization perhaps as old as that of Egypt, exhibits of fibers and textiles woven by a lost people.

Santa Fe itself is as ancient and un-American as the governor's palace. Except for a few modern buildings, it is another Seville. Donkeys, with bells about their necks and bearing loads of wood upon their backs, trot through the narrow streets. Ragged peons, astride tiny burros, canter by. Natives, dressed in bright serape or blanket, moccasined and hatless, loll in the flower-scented plaza. The population is largely Mexican, descendants of proud dons that were the feudal lords of the southwest only a century ago.

Diagonally across the square from the governor's palace stands the Fonda, once known as the old Exchange hotel. This was the official terminus of the Santa Fe trail where the stage lines pulled up after their long trek across the continent from the Mississippi. Stand under the arcade, close your eyes and you can almost hear the crack of the bullwhackers' long whips and the scraping of the brakes against the wide-rimmed wheels of the freighter's wagon as the driver pulls up after his perilous journey over plain and desert.

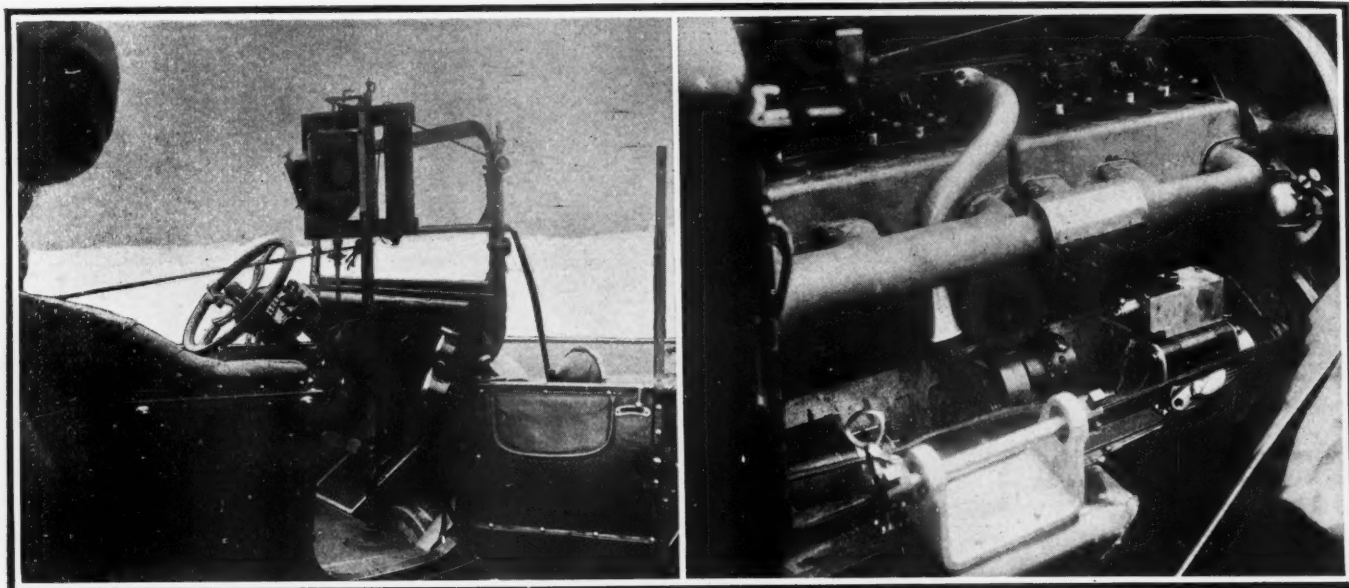
Historic, quaint, un-American Santa Fe! It is a place to rest and dream of the glories of the centuries.





# Determines Fuel Consumption of Electric Starter

Packard Test Shows Only 3 to 5 Per Cent Loss of Energy



PACKARD EQUIPPED WITH AUXILIARY GASOLINE TANK AND MEASURING INSTRUMENT

PACKARD MOTOR WITH DUMMY REPLACING GENERATOR USED IN NO-GENERATOR TEST

NEW YORK, Dec. 1.—In a road test conducted by the Packard company on the Long Island speedway on Saturday last it was found that the Bijur generator fitted to the 2-38 model consumed from 3 to 5 per cent of the power as represented by the gasoline supplied to the engine. These figures are of great interest at the present time in that much discussion is taking place as to the real efficiency of the electric system of lighting and starting motor cars. Opponents have contended that the power absorbed in driving the generator to be so great as to render the advantages of electricity doubtful.

The car was driven by Frank H. Trego, the Packard engineer, and the method of running the tests, which were officially observed by Herbert L. Chase, of the A. C. A., was as follows:

The car, a 2-38 Packard, equipped with a Bijur 6-volt lighting and starting system and Willard 120-ampere hour battery, was fitted with a special 1-gallon gasoline tank, placed conveniently for observation over the dash, and was started off from a marked point on the speedway, with five passengers up. Before doing so the battery was brought to a state of low charge by running the starting motor, and consuming power by churning the engine. A sensitive ammeter then was connected to the generator so as to read the total output throughout the run. Tire pressure readings were taken to insure accuracy especially in regard to the front wheel from which the odometer drive was taken.

The car was then run with all lamps lighted, at a constant speed of 20 miles per hour until the indicator tube at the side of the special gasoline tank showed

that half the gallon had been used, when a return was made over the same course and a distance reading taken.

A similar run then was made at 40 miles per hour over the same route, doubling earlier to allow for the decreased mileage possible at the higher speed. It was found that exactly 13 miles were run to the gallon at the lower speed and 11 miles at the higher speed. During both runs the ammeter reading was carefully noted, the average loads being 18 amperes and 16 amperes respectively.

Then the generator was removed entirely from the car and a dummy, consisting of an aluminum frame supporting a plain shaft in ball bearings exactly similar to the generator shaft, substituted so as to carry the drive to the magneto. Two further runs then were made with all conditions, excepting the absence of the generator, precisely the same as in the generator tests. The results were that at 20 miles per hour a distance of 13.7 miles was covered and at 40 miles per hour the car travelled 11.4 miles.

Finally, on replacing the generator a check run was made at 20 miles per hour. The result was 13.2 miles to the gallon, a sufficiently near figure to the 13 miles previously registered to show that the comparison with the no-generator tests would possess a useful degree of accuracy. The results in tabular form appear below:

WITH GENERATOR					
Speed M. P. H.	Miles per gallon	Gallons per mile	Average amperes	Lamp load	
20	13	.077	18	10	
20	13.2	.076	17	10	
40	11	.091	16	10	
WITHOUT GENERATOR.					
20	13.7	.073			
40	11.4	.088			

The lamps consisted of 24-candlepower tungsten headlights, 6-candlepower side lights, two rear lamps and two instrument lamps on the dash, totalling up to a load of 10 amperes. The surplus over this figure in the ammeter readings therefore indicates the amount of current passing as charge into the battery. The voltage at the generator terminals was 7 throughout, being maintained at this figure irrespective of the speed of the armature by means of a regulator of the vibrator type in conjunction with a high resistant in the field circuit.

Deducting the gallons per mile of the two sets of tests it will be found that at 20 miles per hour .004 gallons per mile represents the quantity used for driving the generator and at 40 miles per hour .003 gallons. These work out at 5.2 per cent of the gallon consumption at the lower speed and 3.3 per cent at the higher speed.

Though these figures are of great interest as showing the amount of power necessary to drive the generator it should be remembered that this varies with the load, whether the lamps are lighted, etc.

## ENGINEERS IN CHAIN DISCUSSION

New York, Nov. 28.—At a meeting of the metropolitan section of the Society of Automobile Engineers held here John E. Cautley presented a paper on "Roller and Silent Chains, Their History, Design and Use." Mr. Cautley pointed out that the two most important principles of a roller chain that met the requirements of standardization are, first: Maximum wearing surface for the minimum of weight consistent with the required strength and, second: such a proportion between roller



diameter and sprocket as will allow the maximum wear on both with proper gearing.

Mr. Cautley traced the history and development of the silent chain itself as well as its applications. Of particular interest was the fact that many of the silent chains whose history dates back to 1905 are in use still, although they were made with plain unhardened links operating on hardened pins. The most modern chains incorporate a split bush or liner for the larger sizes and in the smaller sizes a hardened steel bushing is inserted in the links to provide the best possible bearing surface.

After Mr. Cautley's paper, Arthur B. Browne presented a paper on intake manifold design. In this paper it was pointed out that the two important features of an intake manifold were that it should distribute the same amount of charge to each of the cylinders and that these charges should be of the same constituency. The difficulties in the way of successful manifold design have increased rather than decreased owing to the use of the low gravity fuel. It requires high velocity to carry the particles of fuel into the cylinders and this cannot be depended upon alone because if a minimum of 30 feet per second is necessary to keep the fuel in suspension, then the highest velocity would reach over 450 feet per second and this entails a volumetric loss of 11 per cent. A high degree of atomization combined with a heated smooth-walled intake manifold having curves of long radius is the best combination.

#### MIDLAND CASE UP AGAIN

Moline, Ill., Dec. 1—The affairs of the Midland Motor Co., of Moline, are up again before E. U. Henry, referee in bankruptcy, 100 contested claims, aggregating \$250,000 being filed. This is the largest bankruptcy case that has ever been handled in the central Illinois district, the total liabilities approximating \$450,000.

#### GRANTS BUY FINDLAY PLANT

Detroit, Mich., Nov. 29—Purchase of the plant of the Findlay Motor Co., at Findlay, Ohio, by the Grant Motor Co., of Detroit, was announced Thursday. This plant has a floor space of 50,000 square feet and covers all of the needs of the Grant company which brought out some time ago the Grant car, a small car to list at about the \$500 price. Work at the new plant is to be started immediately and the demonstrators will be shipped to the 220 dealers who have been appointed in the United States and foreign countries.

#### WAVERLEY REPORTS SNUG PROFIT

Indianapolis, Ind., Dec. 1—At a meeting of stockholders of the Waverley Co. in Indianapolis a few days ago it was shown that the gross business for the last year was \$1,312,815.94 and that upon a capitalization of \$190,000, the company reports a

capital surplus and undivided profits amounting to about \$590,000. Officers and directors were elected as follows: President, William B. Cooley; vice-president, Herbert H. Rice; secretary, Wilbur C. Johnson; treasurer, William Kothe, and directors: Hugh Daugherty, Joseph C. Schaf, Alexander C. Ayres and Hugh M. Love.

#### NEW KISSELS ANNOUNCED

Milwaukee, Wis.—Dec. 1—George A. Kissel, president of the Kissel Motor Car Co., Hartford, Wis., and Milwaukee, while in Milwaukee last week, announced that early in January two entirely new models of the Kisselkar will be placed on the market. The cars will be a four-cylinder type at a lower figure than any Kisselkar heretofore has been sold, and a light six-cylinder car which will list for considerably less than \$2,000. Details of the new models are not available at this time, but immediately after Christmas time the announcement will be made as to details and prices of the newcomers.

#### WILL MAKE LINDSAY WHEELS

La Porte, Ind., Dec. 1—The Great Western Mfg. Co., of this city, has taken over the patents and business of the Lindsay Auto Co., of Indianapolis, and will turn

out the Lindsay patent wire wheel for motor cars and cyclecars. A specialty will be made of wire wheels for Fords, the Ford size axle having been adopted. These wheels will be supplied in the following sizes: 28 by 3, 30 by 3, 30 by 3½ and 32 by 3½. Later on the Lindsay demountable wheel in standard sizes taking in 36 by 4½ and 37 by 5, will be made. The general sales agents will be Brandenburg & Co., Chicago, Detroit and New York.

#### HARROUN MOVING TO PITTSBURGH

Indianapolis, Ind., Dec. 1—By a business deal consummated last week the Harroun company of Indianapolis, manufacturer of a kerosene carburetor for motor cars, will be absorbed by the Electric Renovator Mfg. Co. of Pittsburgh, Pa., made up by prominent oil operators. The factory will remain temporarily in Indianapolis, and will be operated in conjunction with the Pittsburgh factory. Ray Harroun will remain with the new interests as an officer of the company. The company will maintain an office in Indianapolis as well as its present offices in Pittsburgh.

The Electric Renovator Mfg. Co. is to have an office in this city as well as its present offices in Pittsburgh.

## Long Block Test for Moline Motor Knight Engine to be Run 2 Weeks by A. C. A.

NEW YORK, Dec. 1—President W. H. Van Dervoort, of the Moline Automobile Co., announces that on December 19 the Automobile Club of America's engineering department will start a public test to continue for 2 weeks, day and night, to determine the power, flexibility, economy and reliability of the Moline-Knight motor. On December 17 the motor will be put on the block in the A. C. A.'s laboratory for a 2 days' preliminary run. At noon on December 19 it will be started on its 336-hour run at 1,200 revolutions without stop during the 2 weeks. Every 15 minutes officials of the Automobile Club of America will make records of the performance which will be made public after the test.

The maker of the Moline-Knight will file a bond or cash, whichever the officials of the Automobile Club of America may wish, that the Moline-Knight motor is not of special manufacture for this test but is a stock motor such as will be embodied in all Moline-Knight cars. Following the high-speed run of 2 weeks, Moline-Knight officials also have asked the Automobile Club of America to disassemble the motor for the purpose of ascertaining and making a public report of the true condition of the motor following its severe test. The disassembled motor will be placed on exhibition in the Moline-Knight salesrooms on Broadway for public inspection.

This test will be, in a sense, the sequel

to those made by the Royal Automobile Club on the Daimler-Knight engines in 1909. The two motors then tested ran continuously for 132 hours, developing an average horsepower more than 30 per cent above their R. A. C. rating. The test to be undertaken in the A. C. A. laboratory is planned to run continuously for 336 hours—a full 14 days—and will, if completed, exceed in duration any official test of the kind ever attempted, either in this country or in Europe.

The rules prepared by the A. C. A. technical committee to govern all endurance tests of this character embody, among other requirements, the following:

That the entrant specify the duration of the test, when in excess of the required 100 hours, and the speed at which the motor is to run.

That prior to the endurance test short tests at various speeds be made to determine the characteristics of the motor.

That interruptions of the test, due to failure of the motor, shall render the test incomplete. The test may, however, be begun anew, if the entrant so elects.

That no adjustments be made during the test, save by special permission of the committee, and then only such minor adjustments as are necessary to restore original settings, and are possible without stopping the motor.

That during the endurance run not less than .3 horsepower be developed per cubic foot of volume per minute swept out by the pistons on their aspirating strokes. This requirement makes it necessary for the motor to develop a trifle more than its S. A. E. rating; if running at 1,000 feet per minute piston speed, and proportionately more, if a higher speed is selected.

That the motor be subjected to inspection prior to and following test, the conditions thereof to be recorded.

That the report of the test contain full particulars regarding the motor, its performance, and all events occurring during the test.



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## Our Kaleidoscopic Southwest

**F**AILURE to appreciate his own country and ignorance of the scenic and historic attractions of the United States are faults common to the average American tourist. Tell him that there are mountains in Colorado that compare favorably with the more famous peaks of Switzerland and he will laugh at you. Speak of ruins in New Mexico and Arizona that are as ancient as the antiquities of Babylon, Egypt or Italy and he will propose your name as a member of the Ananias Club. Merely mention that in the American southwest there is a primitive people as picturesque as the peasants of Spain or the roving bands of Arabia and he will yawn to politely challenge your veracity.

**"S**EEING is believing" and the majority of American tourists have eyes that see only smoke-veiled cities and bucolic acres of wheat and corn in a country that offers them every attraction that the countries of the old world offer and at a great economy of money and time. They seem to lack the pathfinding spirit. They prefer to follow the man from Cooks and enthuse over European scenery and European antiquities that tens of thousands enthuse over every year while America remains a land unknown because so few have a desire to explore it.

**I**N order to prosecute the "See America First" movement and prove to the skeptical that this country has as great scenic attractions to offer as Switzerland, Scotland or any of the other much-visited European countries, Motor Age last year co-operated with the Automobile Blue Book in a tour of exploration that covered 1,000 miles in Colorado. The result of this initial effort was most encouraging. Hundreds of motor car owners for the first time realized that the Rocky mountains could be visited in a motor car and that there were roads in the western state that would permit of extensive touring, roads build by convicts that were as wide and smooth as the highways of the middle west and east.

**T**HIS enjoyable task of pathfinding for the motorist was continued this year. The unknown and unappreciated southwest was selected as the region to be visited. In this issue of Motor Age the report of the trial-blazers begins. The southwest is the most interesting section in the United States. It combines the mystic with the scenic and historic. It is a bit of Spain, a bit of Arabia, a bit of Switzerland, a bit of Egypt all combined. Within the confines of two states, New Mexico and Arizona, are rugged mountains, great deserts and vast forests. "The object of the journey is not only to arrive at the goal but to find enjoyment on the way." Thus writes our modern classicist, Henry Van Dyke. To the motor tourist who holds the same view, the southwest offers an opportunity for enjoyment every mile of the journey. There is a wonderfully colored and restful sky overhead, a sky that changes with the hours and the moods of the hours. There are sunsets that never can be duplicated on canvas, for there is no artist alive masterful enough to mix the tints with which the sky is lighted. There are mountains and canyons and valleys splashed with color and defying all laws of geologic formation. In addition, a visit to the terraced towns of the Pueblo and Moqui and the reservations of the Navajo and an inspection of the aeon-old ruins of the lost cliff-dwellers enhance

the pleasures of touring in a picturesque region of barbaric coloring that is totally foreign to any other part of the country.

**U**P to the present there has been little touring in this section of the country, not because the roads are not good and the people inhospitable, for they are, but because it is practically unknown to motorists outside of the states of New Mexico and Arizona. Because it is not a mecca of tourists is one reason why the natives have suffered so little from the encroachments of our blighting civilization. But the southwest will be popular and those who wish to view it before it has been spoiled by commercialism had best visit this region within the next 2 or 3 years.

## Rules of the Road Overlooked

**C**HICAGO as a city is striving to handle the motoring subject intelligently. It has made rapid strides in solving the traffic problem in the loop district and it has endeavored to educate the driving public through the medium of a so-called speeders' court where the presiding judge has shown a leniency that would have been considered remarkable a half-dozen years ago when city officials as a rule were what might be termed motor phobes.

**T**HAT this innovation is a step in the right direction is shown by the report of the judge who has presided over this speeders' court for a year, who reports that in this time 12,897 cases have been heard by him and that a total of \$86,091.95 collected. This judge found that there were few second offenders, that chauffeurs are not the law-breakers they are supposed to be and he also believes that motorists as a rule travel too fast on the city streets. He deprecates the increasing number of accidents and as a solution of most of the motoring evils he recommends that the prima facie clause as to speeds be eliminated and drivers held for the speed at which they travel; that the court be empowered to impose jail sentences; and that the private owner should be forced to take an examination before he is allowed to drive a car.

**T**HERE is considerable common sense in most of the judge's recommendations, but the court does not strike the correct keynote after all; that is as to minimizing the number of accidents. The crux of the whole situation is the failure on the part of the police in general—not Chicago alone, but in nearly every city in the country—to enforce the rules of the road. There would be fewer accidents if all vehicles had to carry lights at night; if every vehicle was prohibited from cutting corners; if no one was allowed to leave a car or rig with the left wheels to the curb; if the slow-moving traffic was compelled to keep next to the curb; if arrests were made when as the driver of a passing vehicle cut between the curb and the rig he has overtaken; and lastly if the pedestrians were compelled to heed the same signals in business districts as the drivers of vehicles, being held up while the traffic in the other direction had the right of way.

**T**HERE are laws enough on the books of every big city to intelligently care for the motor problem; ordinances carefully framed to do away with most of the evils of handling traffic, but the trouble is that these laws are not enforced by officers of the law, except in a very few cases and then generally when they apply to speed and the carrying of lights. The rules of the road are forgotten.



# Faroux Outlines Grand Prix Type Car for 1914

## French Engineer Figures Out Speed Possibilities

PARIS, Nov. 22—Although but one entry—an Alda car—has yet been received for the French grand prix race next July, sufficient is known of the intentions of European manufacturers to estimate on thirty to thirty-five actual starters in this annual event. Delage, Peugeot, and Sunbeam are certain competitors.

Charles Faroux, who has had connections with some of the leading European concerns as racing expert, deals in L'Auto with the question of the type of car to build for this race. Piston displacement being limited to  $4\frac{1}{2}$  liters, there is an infinity of relations which will give the required area, says Faroux. It is possible to build four-cylinder motors of 112.5 by 112.5 millimeters, 100 by 143, 95 by 158, and 94 by 162 millimeters. In order to determine the most advantageous dimensions, it is necessary to consider previous experience. We must decide what piston speed we can adopt; the number of revolutions; what difficulties we are likely to meet with under the heading ignition, and we must also take account of specific weight. Considering all these points, the choice is in favor of a four-cylinder motor of 94 by 162 millimeters or 3.7 by 6.37 inches bore and stroke. This determined, the rest is easy, for we have a good basis of experience to work upon in the two successful sets of racing cars built by Peugeot in 1913 and 1912.

### Motor Characteristics

The motor will have hemispheric combustion chambers and overhead valves. At the high number of revolutions at which the motor will turn, the question of feeding in the maximum charge will be particularly delicate for the feeding of the mixture into the cylinders under pressure is forbidden. This problem largely will be settled by the timing, to be dealt with later. Multiple valves will be almost indispensable. A tempting solution would be a single large-diameter intake valve in the head of the combustion chamber and two symmetrically-disposed exhaust valves. This would lead to structural complications, and doubtless it would be better to adhere to two intake and two exhaust valves. This will necessitate two camshafts.

From the standpoint of appearance, and viewed entirely from touring considerations, a single camshaft would be preferable. But in this case the conditions are special: it is necessary to obtain the maximum security of operation and the maximum structural commodity. Thus, two camshafts will be employed and will be driven by a train of spur gears. These are to be preferred to bevel gearing by reason of the absence of axial thrust and on account of their simplicity. They will hum, but this is of no importance.

It is worth noting here that this proposed motor is practically the 1913 Peugeot. In 1912 Peugeot had two overhead camshafts operating four valves per cylinder, and a vertical shaft with bevel gearing. There was a certain amount of trouble owing to axial thrust and the 1913 motor was built with a train of spur gears from crankshaft to overhead camshafts.

### Figuring Out the Power

What power can we expect to obtain from such a motor. Calculating on results obtained with this year's 3-liter Peugeot racers—four cylinders of 78 by 156 millimeters—3 by 6.14 inches—it will be possible to obtain 130 to 135 horsepower at 2,700 revolutions. The valves, four per cylinder, doubtless will have a diameter of 45 to 48 millimeters or 1.77 to 1.88 inches. It hardly will be necessary to employ bigger diameters, and these dimensions will not entail excessive gas velocities. It is not possible to amplify this feature without revealing professional secrets. The timing of the motor doubtless will be as follows:

Lag in intake opening	.....12 degrees
Lag in intake closing	.....45 degrees
Lead in exhaust opening	.....45 degrees
Lag in exhaust closing	.....18 degrees

The exact timing is really a matter for laboratory tests. It should be noted that the proposed timing is practically that adopted on the 1913 Peugeots.

The Lyons course makers a four-speed gearset practically indispensable. Final drive will be by bevel type rear axle with two universal joints on shaft and drive and torque taken through the springs. This system has thoroughly proved its value on Delage, Peugeot, and Sunbeam cars. Tire sizes will be 880 by 120 for driving wheels or 34.6 by 4.7 inches. It will not be necessary to carry more than 22 gallons of gasoline. One stop for filling up will be necessary, but it will be a decided advantage to the driver to have a perfectly balanced car. Total unloaded weight need not exceed 1,900 pounds. The reduction of head resistance must be passed over in silence; it cannot be discussed without revealing what the individual makers intend to do.

### Speed Possibilities

The only other question to be discussed is the speed of the car on a level road. The 3-liter Peugeot developed 92 horsepower at the most efficient engine speed. We can take 90 horsepower as a very reasonable figure. The car weighed 2,645 pounds in full running order and attained slightly more than 93 miles an hour on the level. From this the efficiency on direct drive can readily be deducted. It is about 75 per cent. This is the net efficiency taking into account universal joints, wheel and tire resistances. The 1914 car

will not exceed 2,860 pounds in full running order. The head resistance will be about the same as on the 3-liter models ( $KS = 0.06$ ), and as we can consider the road resistances as equal to 12 kilos per ton, the total resistances will be as follows, considering  $V$  as the maximum speed of the car:

$$[15.6 + 0.06 = V^2] \text{ kilogrammes}$$

Multiplying by  $V$ —distance covered in 1 second—we obtain the resultant energy, which should be equal to the energy of the motor, which is 7,500 kilogrammes-meter—power of a motor of 133 horsepower with an efficiency of 0.75. We shall thus have to solve the following equation:

$$0.06 V^3 + 15.6 V - 7,500 = 0$$

which gives to the quantity  $V$  a value of 49 roughly. Forty-nine meters a second is equal to 176 kilometers an hour or 107 miles. The wheels of the 1914 racer will have a diameter of 880 instead of 820 for the 3-liter model. This will affect the value of the calculations slightly. In any case it practically is certain that a speed of 105 miles an hour will be attained.

### Analysis of 1914 Cars

Summarized, the 1914 cars will have the following characteristics:

Four-cylinder motor of 3.7 by 6.37 inches bore and stroke; hemispheric combustion chamber; four valves per cylinder.  
Weight, 1,980 to 2,000 pounds empty.  
135 effective horsepower.  
100 horsepower delivered at the road wheels.  
105 miles an hour on the level.

### INTERCITY MATCH PROPOSED

Chicago, Nov. 28—A proposition to stage an intercity team match next summer between Chicago and New York took definite form last Tuesday night at the trophy dinner of the Chicago Automobile Club, held to celebrate the victory in the fall match over the Chicago Athletic Association. Both teams being represented, a direct challenge was formulated and has been sent on to New York, while a trophy for such a match has been offered by Allen S. Ray, president of the Chicago Automobile Club.

The two Chicago organizations have been participating in these team matches for the last 6 years and now aspire to bring about an intercity contest. As roughly drafted, the idea is to have the New York Athletic Club and the Manhattan Automobile Club engage in a team match in June, while the two Chicago clubs will hold a similar contest at the same time. The two winners then are to get together and it has been suggested that Buffalo would make an ideal place for this. Each team would be limited to about five cars to a side and the same interclub rules, penalizing only for work and time, could be used in the clash between the two cities.





CHAMPS ELYSEES, PARIS, DIVIDED INTO FOUR TRACKS FOR HEAVY FLOW OF TRAFFIC

## Paris Improves Its Methods of Handling Traffic

### Accidents Minimized by Segregation of Motors and Horse Vehicles

PARIS, Nov. 19—Avenue des Champs-Élysées, Paris, the first city highway to be divided into parallel tracks for respectively horse and motor traffic, has had to be rearranged in view of the continued increase in the number of motor cars.

Between 6 and 7 years ago the police authorities decided to divide this aristocratic avenue into three tracks of equal width, the central one to be used exclusively by up and down streams of motor cars, and the two outside tracks for respectively up and down horse traffic. The innovation was successful from every standpoint. Of late years it has been recognized that the amount of space given to motor traffic was inadequate. Thus, a considerable portion of the avenue has now been divided into four tracks, and the remainder will be converted as soon as possible.

Under this arrangement, the outer tracks, next to the side walk, are for up and down streams of horse-drawn vehicles, bicycles, pushcarts, etc. The two middle tracks are for up and down streams of motor cars. The division is marked by three refuges, or islands, placed at intervals. Distance between each island is 18 feet, measuring from sidewalk to No. 1 island, No. 1 island to central refuge, central refuge to No. 3 island, and No. 2 island to sidewalk. Horses and motor cars have thus the right to 36 feet of highway each, but the motor section being in the center is more valuable than that for horse traffic, there always being a certain zone close to the sidewalk which is used very rarely.

The Champs-Élysées probably carries more traffic than any highway in the world. A recent census taken from 10:30 to 11:30 a. m. showed that 356 horse vehicles passed a given point in the avenue and that the number of motor cars was 1192. When this census was taken the amount of traffic was normal. The time

was most favorable to horse vehicles, for it is during the morning, from 10 to 12, that practically the goods deliveries take place, and almost all this work is done by horses. The 356 horse vehicles comprised two private carriages, 186 horse cabs, and 169 delivery vans—groceries, laundry, express, etc. The motor cars consisted of forty-six delivery vans, fifteen motor buses, 231 taxicabs, and 900 private cars. During the height of the spring and autumn seasons, the number of motor cars passing a given point in the Champs-Élysées is not less than 5,000 an hour at certain times of the day. The average number of motor vehicles passing within 24 hours during the month of November is between 9,000 and 10,000.

The most prominent results of the division of horse and motor traffic have been the increased average speed and the diminution in the number of accidents. An average of 20 to 23 miles an hour for the run through the Champs-Élysées is quite common when traffic conditions are normal. All the delays arise from cross traffic, there being several important arteries traversing the Champs-Élysées.

Practically all the accidents result from this cross traffic, the great width of the avenue making it difficult for any one policeman to control the streams, and the authorities, in view of this difficulty, preferring to leave drivers to work out their own salvation. A certain number of accidents occurred among motor vehicles when the up and the down traffic was confined to one track. Now that there is a separate track for each stream, the accidents under this head have decreased considerably.

Greater cleanliness results from the division of traffic, thus less skidding and a lesser number of accidents. Slow traffic being next to the sidewalk, there is less danger to careless pedestrians who step off the sidewalk onto the roadway with-

out looking round. A horse makes more noise than a motor car under city conditions and therefore gives more warning.

The division of the avenue into horse and motor tracks has resulted in a saving of about 35 per cent to the street maintenance department. Half the width of the avenue is slightly oiled by drippings from cars and polished as smooth as a ball-room floor by the rubber tires. There is absolutely no picking effect on the wood blocks. The motor tracks never need washing and rarely need sweeping. It is only at one end, and in very dirty weather, that the track needs attention from the sweeping brigade; this is because of the dirt brought in on the wheels of cars after running in streets with mixed traffic. In dry weather the rush of air from the fast motor traffic blows all the dirt into the outer horse tracks. These tracks have to be washed and brushed every night and by reason of the picking effect of horses' hoofs and the rotting effect of horse drippings, the blocks have to be changed at much more frequent intervals than in the central portion of the avenue.

#### U. S. ROAD COMPARISONS

Washington, D. C., Nov. 30—Of more than ordinary interest to motorists throughout the country is a comparison between the expenditure on public roads in the United States in 1904 and in 1902, just compiled by the office of public roads of the agricultural department. It shows the tremendous growth that has taken place in the movement for better highways within the last 8 years.

In 1904 the total expenditure on all public roads in the United States was \$79,771,417, but in 1912 the expenditures for this purpose amounted to \$164,232,365. The expenditure per mile of public roads in this country for 1904 was \$37.07, but the expenditure per mile for the year

1912 had doubled, amounting to \$74.65. The expenditure per inhabitant in 1904 was \$1.05, but in 1912 it amounted to \$1.78.

The great progress in road building has been made in the states which contribute from the state treasuries toward the construction of state-aid or trunk-line roads. In 1904 there was thirteen states that contributed out of the general fund, \$2,607,000, but in 1912 there were thirty-five states, which contributed \$43,757,438. The states having the largest expenditures for state-aid and trunk-line roads in 1912 were as follows: New York, \$23,000,000; Pennsylvania, \$4,000,000; Maryland, \$3,370,000; Connecticut, \$3,000,000.

### JERSEY CATCHES MANY SCORCHERS

Philadelphia, Pa., Nov. 29—So great is the temptation to take advantage of New Jersey's fine roads and so vigilant are the officers that in the district comprising Camden, Gloucester and Salem counties, violations of the speed laws have become so numerous that statistics compiled on the subject show a total since June 1 to the present time of 276 arrests made, mostly Philadelphians, and fines collected aggregating more than \$3,800, sufficient to liquidate the expenses of officials attached to that district.

### WOULD MAKE UNIFORM LAWS

New York, Dec. 6—A definite effort is to be made to revise the chaotic road laws of the various states with a view to codifying and simplifying them and making them more uniform. This work will be undertaken by the American Automobile Association, the American Highway Association and the American Bar Association. The plan which has been evolved is so comprehensive that it is believed it will eventually result in a more uniform system of all laws, not merely those dealing with road matters, but those dealing with divorce, marriage, and all other subjects.

A committee of the American Highway Association has been appointed to take charge of the matter and this committee is to meet with C. T. Terry, of New York, who is chairman of the committee on uniform legislation of the American Bar Association, at the Vanderbilt hotel on December 12.

Many of the road laws are 100 years old. They are based on colonial legislation, which, in turn, had been based on ancient English precedent. There is little uniformity in the laws among the states and it is felt that this fact puts obstacles in the way of those who are seeking to give the entire nation a network of improved highways.

It is probable that as a result of the meeting to be held in New York the governors of the various states will be asked to urge upon the legislatures the appointment of commissioners who will codify, revise, and simplify the laws.

## Chicago's Speeders' Court a Success

Arrests in Year, 12,897; Fines, \$86,091.95

CHICAGO, Dec. 2—That motorists are not such a ferocious and lawless tribe as some people imagine is the opinion of Judge Sheridan E. Fry, who, sitting as the Solomon of Chicago's speed court for the past 12 months, has listened to the confessions and alibis of 12,897 drivers of motor cars arrested for violations of state and municipal vehicle laws and assessed fines amounting to \$86,091.95 during the year ending December 2.

To celebrate his first anniversary as lord chancellor of the motorist, Judge Fry today issued an official report that is a mixture of judicial optimism and interesting statistics. Before he took charge of this branch of the city's judicial system, the task of presiding over the speed court was considered most trying and one shunned by judges.

"During my year's regime," Judge Fry writes, "the work of the court has been largely corrective and educational, especially in the so-called cases of minor violations. On the matter of obeying ordinances concerning headlights, tail lights, smoking machines, state licenses, wheel tax, chauffeur's licenses and display of tags, the ordinary citizen would rather be right than wrong. The court has been painstaking in the matter of explaining the requirements of the ordinances and the reasons therefor until it seemed sometimes that the morning session was a school of instruction. I am sure the lessons were effective. While the number of cases of this class were very large, the fines collected were very small.

"Chicago's motoring public is travelling too fast; the fast pace is the pace that kills and injures. A compilation of the 1,527 speed cases tried in June, July and August, 1913—and I believe the same ratios would follow on an analysis of the 4,976 cases tried in the year—show that 404 drivers were arrested for speeding at 25 miles an hour. There were 271 cases at 26 miles, 246 cases at 27 miles and 178 cases at 28 miles. I had three at 48 miles, one at 49 miles and one at 50 miles, the maximum.

"There are few cases where any attempt is made to justify fast driving. The number of cases where women faint in cars is remarkable. The stork special is a favorite plea as a defense. Every speedster that I have had in court and of whom I have asked the question 'Do you not think that 25 miles an hour is too fast for you to have driven at this time and place?' has answered 'Yes.'

"There are few cases of second offenders. In October, 1913, 285 speeders were first offenders, thirty-six had been arrested once before, five twice before and one three times.

"The police records, showing motor car

fatalities and accidents, show that from December 1, 1911, to November 30, 1912, there were fifty-four fatalities and 1,478 accidents and from December 1, 1912, to November 29, 1913, there were sixty-one fatalities and 1,941 accidents. When we consider that there were five motor cars on the street in 1913 where there were only four the previous year, does it not seem that the condition is better rather than worse?

"The provision allowing violators to sign their own bonds has not been abused. Practically all the 12,897 cases had individual recognizances and there are less than seventy forfeited bonds.

"The chauffeurs are by no means the worst offenders. In 1,527 speeding cases in June, July and August, 309 were chauffeurs while the balance covered every line of activity."

In conclusion, Judge Fry recommends the following amendments to the present laws:

The intoxicated driver should be committed to the bridewell or county jail. There should be an amendment to the motor vehicle law to that effect; the jail provision should be compulsory on the court.

Section 10, the speeding section of the motor vehicle law, should be amended so that the rates of speed that now make a prima-facie violation will make an absolute violation, to-wit: 10 miles on a business street; 15 miles in closely built up residence sections; 20 miles in outlying sections and not closely built up in the city; and 25 miles on country roads. Those rates of speed are fast enough.

The court should have power to commit to jail or bridewell for violating speed laws. The law should provide for either fine or imprisonment or both. That would be the effective solution of the speeding situation.

Another amendment, that must come has to deal with the licensing of operators of motor cars. The chauffeur is required to pass a technical examination, but the individual owner, who drives his car, is not required to pass any examination. With this amendment and the power of the court to penalize by revoking licenses for violations, say in the case of reckless, drunken or persistent violators, the law will be as perfect as it can be possibly made.

### NEW YORK IN SPEED CRUSADE

New York, Dec. 2—Three hundred and sixty-five speeders faced the bar of justice in various police courts yesterday and paid close to \$5,000 in fines. The fines averaged about \$50 a piece. Practically every city magistrate in Manhattan and the Bronx stepped into the crusade against speeding and reckless motorists yesterday and imposed heavy penalties upon the persons caught during the spectacular police activity in the most used thoroughfares of the city Saturday and Sunday.

In the long list of prisoners who paid fines were many persons residing outside the city. Bob Burman, the racing driver, was fined \$25 for operating his car at 25 miles an hour. Magistrate Deuel rendered a decision holding guilty a driver of a motor mail truck accused of reckless driving and fined him \$25. He declared no class of vehicles is exempt from speed ordinances.

Many of these \$50 fines were for first offenses.



# Minute Accuracy as Practiced by Car Makers

## Great Care in Manufacture of Parts and Assembly Afterwards Necessary to Get Best Results

### —Marmon's System Explained and Illustrated

THE difference in the degree of accuracy which enters into one make of car frequently is but vaguely understood by the car buyer as compared with the accuracy used by another concern in building a similar size of car. The car buyer knows that he pays perhaps \$1,500 more for one size passenger car than another, both with approximately the same cylinder sizes, both with almost the same size tires, both with the same wheelbase, both with the same make of magneto, both with the same make of self-starter, and perhaps a more attractive looking body than the cheaper car.

If you are a close student of car construction perhaps you can notice in the design of parts where one is superior to the other, but hidden under the body in the expensive car very frequently are a score or more of examples of the utmost accuracy in the manufacture of parts, which accuracy is impossible for the added price of one car as compared with another. You cannot see this accuracy with the naked eye, even if pointed out to you. It can only be discovered with the micrometer, with test gauges, and with other instruments designed to measure to the one ten-thousandth part of an inch.

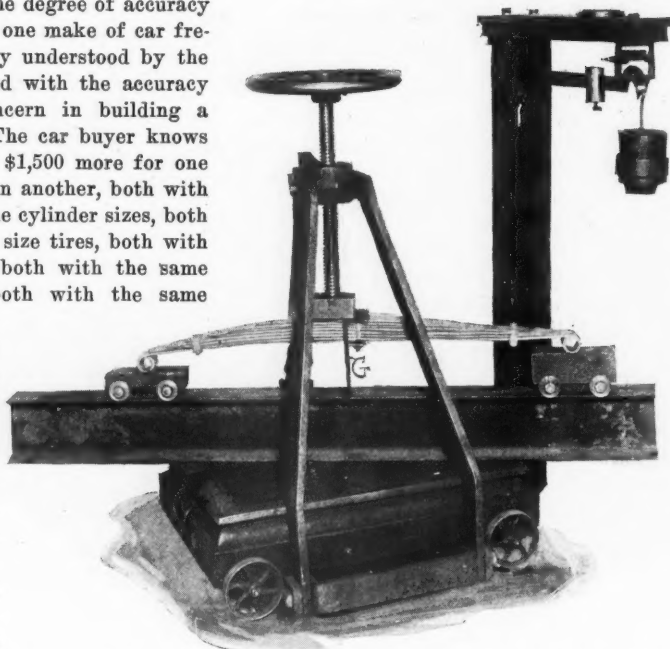


Fig. 1—Scale arrangement showing how every spring used on the Marmon car is tested before being fitted in the chassis

But all accuracy in a car is not confined to the accurate measurement of parts but often depends on the accuracy of how one part is related to another in the car. For example, it is highly important that two shafts in a gearset be parallel, not nearly parallel; it is necessary for camshaft and crankshaft to be parallel, not nearly parallel; it is necessary for connecting rods to be really balanced, not almost balanced. But you can go further in accuracy, and get general results by building special machines which are intended to make all duplicate parts the same. These special machines are expensive to build and often production by them is more expensive than with standard machines, but if accuracy is obtained at not too disproportionate cost, then it means car parts that will

wear 5, 8, or 10, or perhaps 25 years as compared with others that will wear but a season or so and become noisy or loose.

This article is illustrated with photographs recently taken at the plant of Nordyke & Marmon, Indianapolis, Ind., these photographs being intended to show some feature in the Marmon campaign for accuracy. This company has expended \$40,000 in jigs for one of its 1914 models, this being spent to insure accuracy in the duplication of various parts.

#### Making Sure of Springs

Every spring used in the car, whether front or rear, is tested, the test being to put on the spring a load approximately the same as the weight the spring will have to carry when fitted in the car and the car carrying its rated passenger load. To do this, the spring is mounted on two miniature carriages on a beam resting on the scale platform. A screw is brought upon the top of the spring, Fig. 1, and turned until the spring is deflected to a certain amount indicated by the gauge G, this deflection being approximately the same as would be caused by the car with passengers. The total weight then exerted on the scale beam is taken, this approximating 1,300 pounds which when 130 pounds, the weight of the spring and equipment is subtracted, leaves 1,170 pounds as the pressure exerted on the spring to bring it to the necessary deflection. Should the spring vary more than 50 pounds in bringing it to this deflection, it is returned. Having all of the springs of uniform strength in this way assures an even body support.

Every gear in the gearset is tested as follows: After the gear is cut and hardened the outside face of the tooth is ground to get below the deep carbonization film. Every tooth then is tested with a sclerescop, Fig. 2, and if one tooth in the gear is shown under 75 hardness in this test it is rehardened. This done the

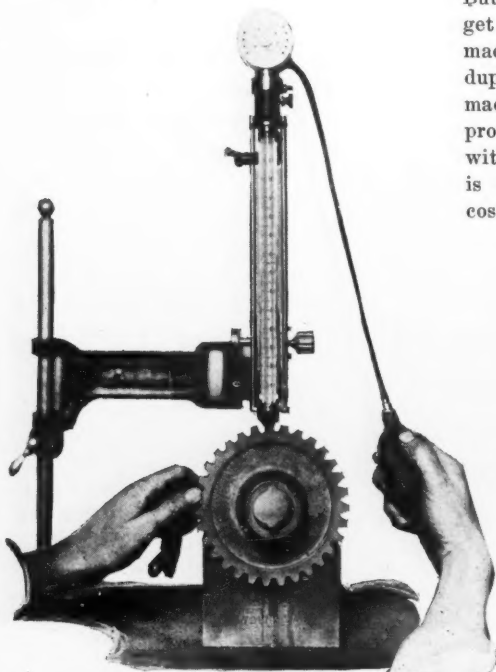


Fig. 2—The sclerescop by means of which the hardness of every tooth in every gear is tested

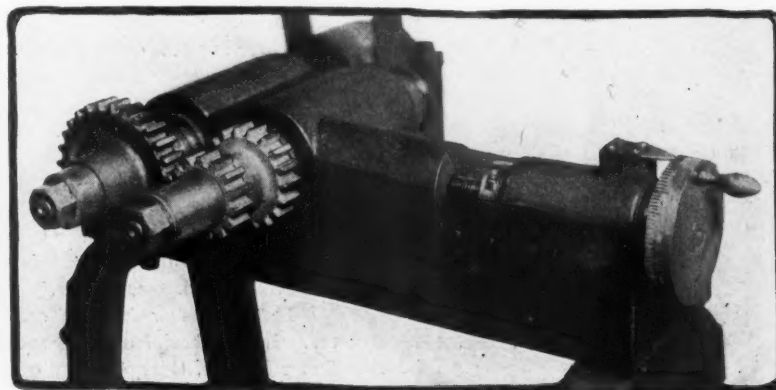


Fig. 3—Special gear-test machine in which transmission gears are tried out in pairs to be certain of proper meshing; the center distances on this machine are the same as those between the shafts of the gearset when the gears are in use



gear is chucked by pitch diameter and the hole is ground to size, no limit over one-half of one-thousandth permitted.

This done, the gear goes to a Brown & Sharpe spur-gear-tester where it is tested with a master gear to discover high spots on the teeth and to ascertain if it is true to size as sometimes gears expand or contract in the hardening process. If the gear is more than .003 inch out of round, it is not used.

After this inspection the gear goes to another special gear-testing machine, Fig. 3, in which all gears are run with a corresponding gear of the gearset, the reason for this machine being that sometimes teeth will warp or spread. This machine detects any irregularities that exist.

After the gearbox and axle are assembled, the stethoscope is used to discover any unnecessary noises, and the entire axle and gearbox, Fig. 4, are run in the silence room. If a gear is noisy the axle is taken apart and quiet gears put in, the axle not leaving the silence room until it comes up to the necessary standard for quietness.

#### A Delicate Operation

Fig. 5 shows the large jig needed to make certain that the holes drilled in the frame for supporting the motor and gearbox as well as the brackets which must be attached to the frame carrying these parts are accurately mounted. To understand this jig it should be remembered that both motor and gearbox is carried at three points, the motor at a trunnion, 1 in front and on frame brackets, 2 and 3 at the rear. The gearbox is carried on a trunnion, 4 in front and brackets 5 and 6 in rear, the support of each being identical.

In order to get the proper alignment of the crankshaft and gearbox shaft it is necessary that points 1 and 4 be in perfect alignment and that the holes drilled in the frame cross members for supporting the trunnion are accurate. It is equally important that accuracy be had for the mounting of brackets 2 and 3 and that the holes drilled in these be accurate. These supporting brackets B are loosely fitted into the frame channel and properly located from the jig cross-piece C in the ends of which are fore-and-aft holes marking exactly where the bracket must be drilled in order to take the bolts which attach the motor legs to those brackets. The holes for mounting the bracket on the frame are also marked, and the riveting done so that when it comes to assembly both motor and gearbox must positively slip into place without any slippings or adjusting and when they are fitted it is done with the assurance that the crankshaft and gearbox shafts are in perfect alignment. This jig has been in use a little more than a month.

In order to insure the best accuracy in manufacture of the camshafts as well as in the mounting of it the Marmon company uses its camshaft with separate

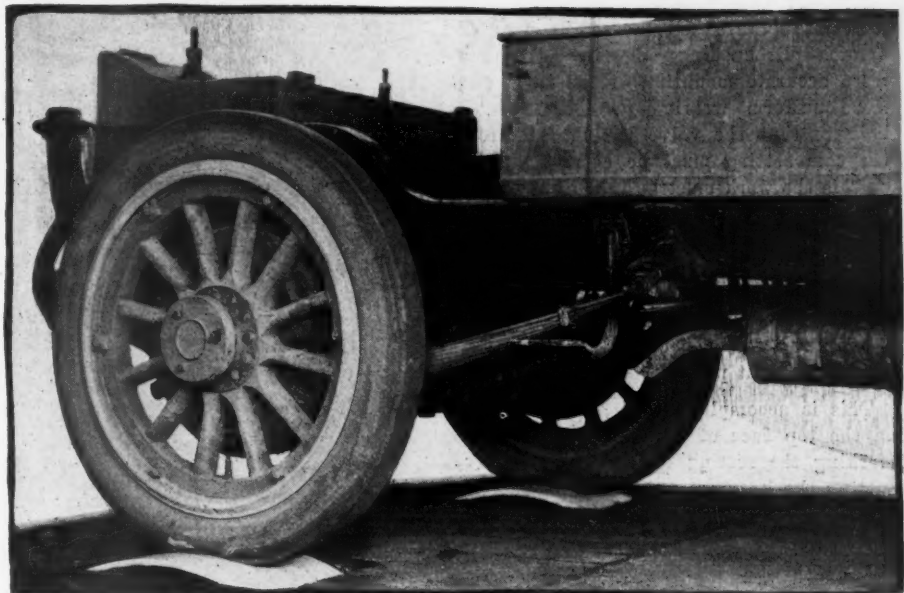


Fig. 4—The combined rear axle and gearset is tested for quietness by mounting the rear wheels on drums extending through the floor; this is the final test

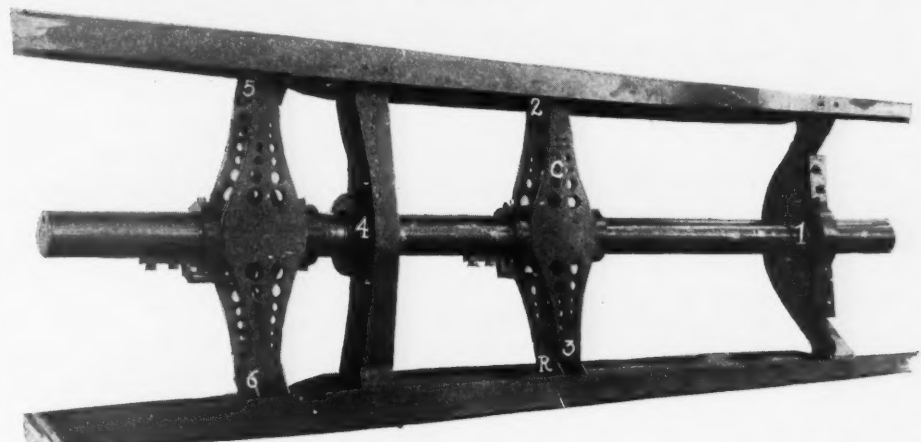


Fig. 5—New jig introduced by the Marmon company to accurately determine the three points at which the motor and gearbox are mounted in the frame. Using this jig makes it impossible to drill the frame at the wrong places

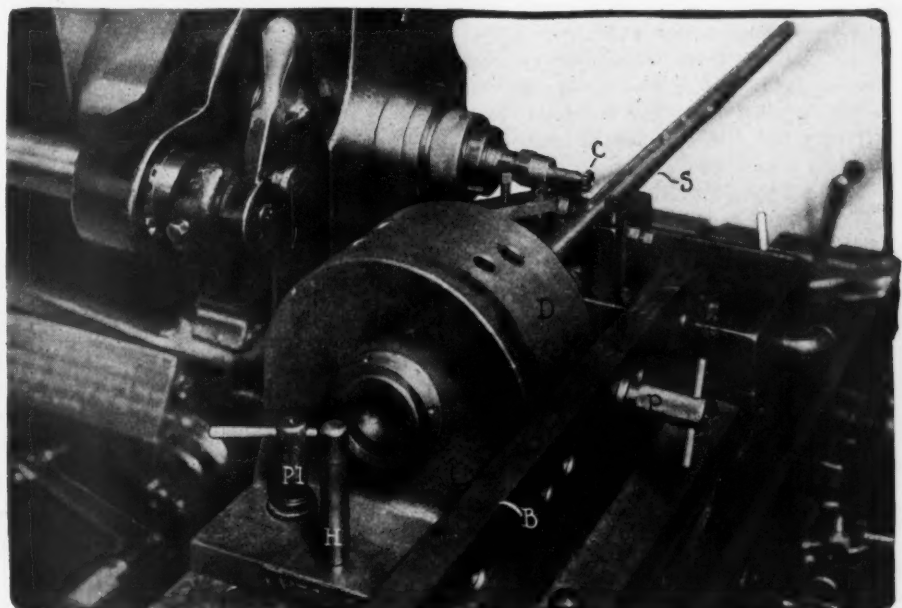


Fig. 6—With this special machine it is impossible to cut the keyways in the camshaft for attaching the cams in wrong positions. The revolving drum D has holes in it which locate the camshaft in its proper position

cams, the object being that by having the cams separate the shaft can be mounted on non-split bushings, thereby insuring a more accurate mounting of the shaft and more uniform wearing possibilities. To be sure that the valve timing is correct the cam setting must be correct and to do this the work must be taken out of the hands of the workmen, which has been done by the design of a special drum D, Fig. 6, which automatically determines the position of the cams in the camshaft test so that the cutter wheel C which makes the keyway for each cam always does its job in the right place.

This is accomplished by a keyboard B on the top face of which are cross lines marking the setting of the drum D, for cutting the keyways for any cam such as inlet No. 1 cylinder, etc. This is done by a located pin P immediately underneath the instruction on the keyboard. This pin P enters a corresponding hole in the drum D only when the drum is rotated to that hole which is also marked inlet valve No. 1 cylinder. The carriage carrying the drum D has a handle piece H by which it can be moved to the required position to cut inlet valve No. 1 cylinder where it is anchored by the pin P1. This done the drum D is then revolved, revolving the camshaft with it, until in a proper position it is anchored to the pin P.

#### Accuracy in the Foundry

To get a good motor means a stout, accurately-made cylinder casting as well as a stout accurately-made crankcase. To get such takes you to the foundry, and as the Marmon company makes all its castings it is possible to get its own desired range of the accuracy. Accuracy in a casting means having the walls of the casting of uniform thickness. For example, the wall of a cylinder should be of even thickness on all sides. Whether or not it is, depends on whether the core has shifted in the casting process, the core being sand filling the waterjacket and other spaces of the casting. In the crankcase the core fills the entire center of the case as well as the opening where the bearings come.

During the past fall the Marmon company has instituted a new foundry process or methods by which this accuracy is obtained. Fig. 7 shows a metal flask end in which a crankcase casting is to be made. In the bottom of it is shown a pattern P which will be recognized as assisting in forming the upper part of the crankcase. It is necessary for accuracy to be sure that this pattern is properly positioned in the flask before the sand is put in over. To do this, the flask has rigid metal cross pieces C and the pattern metal pins D which fit in the reamed holes of these cross pieces so that with the pins in the holes there is no possibility of putting the pattern any way but the right way in the flask.

It is essential that the core forming the opening in the center of the crankcase as well as forming the holes before the crank-

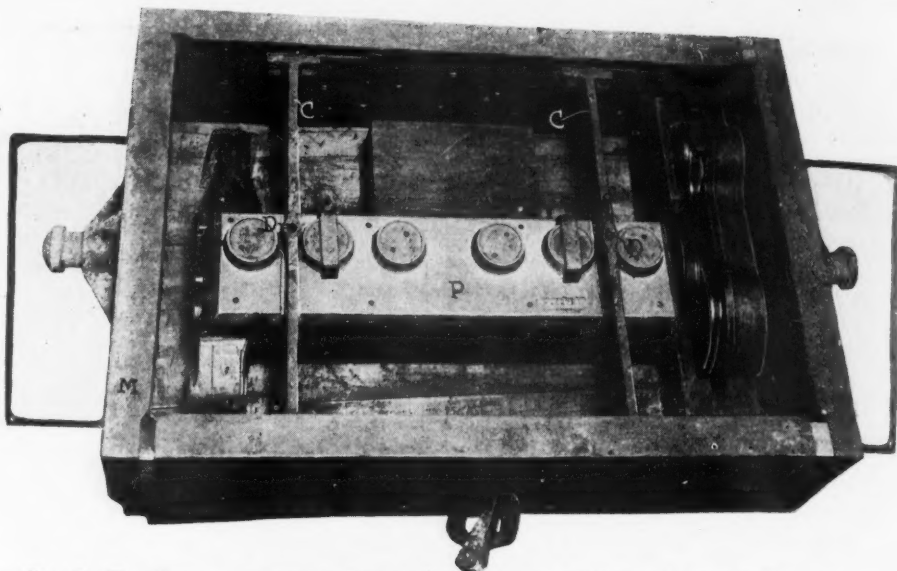


Fig. 7—The Marmon company makes its own cylinder castings and by means of the cross pieces C and the dowel pins D it is possible to get the pattern T in the exact correct position in the box or flask so that the casting will be a uniform one when completed

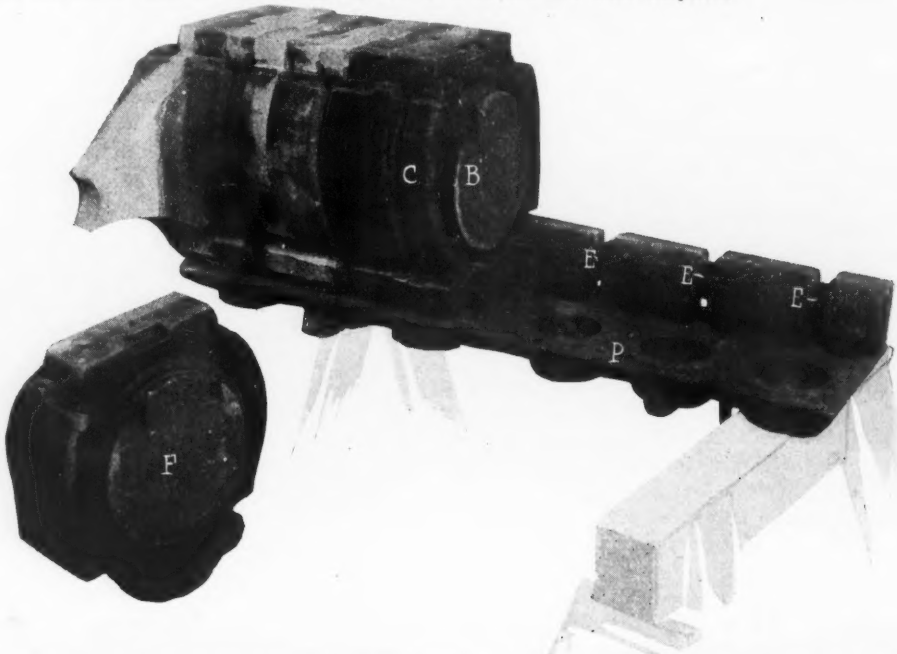


Fig. 8—In order to get accuracy in the crankcase casting the baked sand core pieces F are mounted on a metal plate P which insures that they are in the correct position, this plate having holes into which the core is fitted

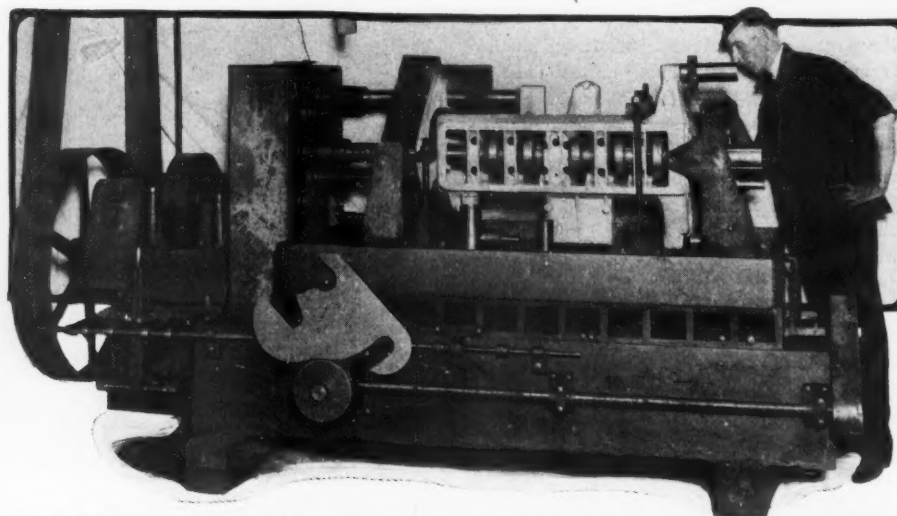


Fig. 9—Special Marmon machine which bores all of the crankshaft and camshaft bearings at one time

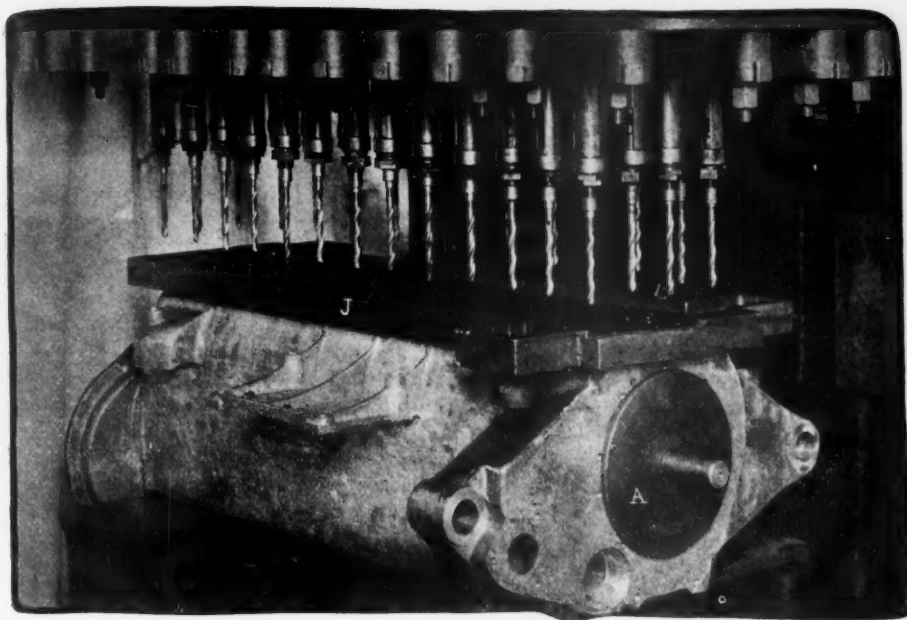


Fig. 11—Multiple drill used for drilling twenty-nine holes in the base of the crankcase

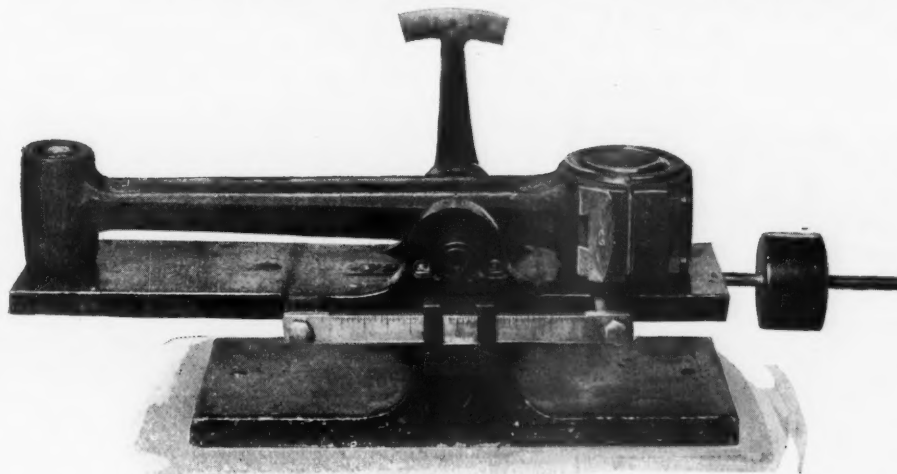


Fig. 10—Scale on which every Marmon connecting rod is laid to be certain it will balance. This insuring that both ends are correctly formed

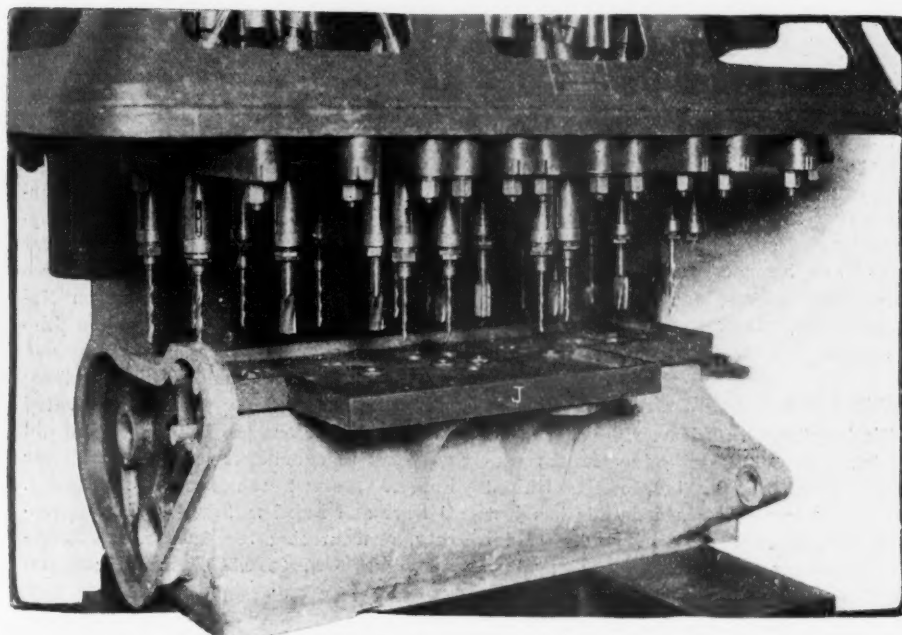


Fig. 12—Jig J for drilling holes in the top of the Marmon crankcase

shaft and camshaft bearings be accurate. To do this, the baked core pieces are mounted on a metal plate P, Fig. 8, this core plate having holes accurately positioned to take the different core pieces. This plate is for a six-cylinder motor and the large holes in the foreground show the openings which the cylinder castings will eventually cover. It will be noticed that each crankshaft bearing will be formed between the core pieces B and C, and the entire camshaft opening by the core pieces D and the camshaft bearing at the points E. F shows how the core is built up in pieces.

To understand why accuracy is obtained by this method of core assembly it must be remembered that ordinarily the core pieces are placed direct in the flask, Fig. 7 and are not mounted on a metal plate such as P. Consequently there is an opportunity for failure in proper alignment of the core pieces which will mean variation in the thickness of the casting or inaccuracies in the exact location of the casting parts which will carry the bearings. When the core plate is eventually lowered into the flask, its dowel pins fit into the locating hole D, so that its relative location in the flask is as accurate as that of the pattern.

#### Boring Crankcase Holes

As soon as the crankcase casting is out of the foundry the first operation is that of boring the seven holes for the crankshaft bearings, the seven holes for the camshaft bearings, and one hole for the magneto shaft bearing. These fifteen holes are all bored at one operation, and on a special machine Fig. 9, designed for this express purpose. It takes  $2\frac{1}{2}$  hours to do the work. The object of this special machine is accuracy. For by having these fifteen bearings bored with one setting and at one time, it is certain to have them all parallel which is quite necessary. But this machine has further use in that by putting on new heads or end pieces H you may use this for boring the crankcases of different models.

The cutters doing this work run at a speed of 75 to 90 r.p.m. and when the bearings are being bored the bed carrying the crankcase, together with the end pieces and the crankcase as well, travel endwise by an automatic speed arrangement. In order to get accuracy, the cutters doing the work for each bearing are examined before starting on each crankcase. This is the first job done on a crankcase. The crankcase is centered on the machine from bosses and sight locating pins at the upper right, and is held down to the bed at the left end the same as it is held in the chassis, the object being to meet chassis conditions as closely as possible in this manufacturing process.

Some conception of the value of this machine and the work it plays in accuracy may be gleaned from the fact that previous to its introduction the crankshaft bearings were bored on one machine; then



the crankcase was taken off and located on another machine and the camshaft bearings bored. This double setting up and adjusting on different machines gave an opportunity for inaccuracy and lack of parallelism between camshaft and crankshaft bearings.

The value of getting the crankshaft and camshaft bearings accurate is still more important in that on every other machine in which this crankcase is worked on afterwards it is located on the machine from the crankshaft and camshaft centers so that with these centers originally right and all future locating done from them the possibility of error is eliminated.

Before any operations are begun on the crankcase such as boring crankshaft or camshaft bearings, milling faces, etc., the interior of the casting is chipped out and cleaned in order to remove all particles that might become loose during the life of the motor and perhaps get in the bearing and ruin it. As a still further precaution the entire inside of the case is painted or enameled with a metal primer. This is then baked at a temperature of 200 degrees for 2 hours, the object of this being to insure that the primer enters

the pores in the case and gets away from all possible ferocity. The heating of the casting for this length of time relieves the strains in the metal caused in the testing process.

The accurate manufacture of connecting rods is one of the most delicate features of car manufacture, and that the even running of the motor to a great extent depends on the accuracy with which the connecting rod is made. The Marmon company aims to manufacture these rods without subjecting the rods to strains, it being a settled fact that if a rod undergoes strains in assembling or manufacture, the rod will under use become deformed. To accomplish this, a special machine is used for milling the faces of small ends and large ends. The drilling of both ends is carried on simultaneously without movement of the drills so that the proper distance between centers is maintained. After completion the balance of each connecting rod is determined on a special scale, Fig. 10. The platform of this scale has a location pin at each end fitting into the bearing of the rod and when so positioned the scale must accurately balance as indicated by the pointer P on the arc-shaped

scale shown. If a rod does not come up to this test it is returned until it is brought up to the requirements.

Fig. 11 shows a multiple-spindle drill with twenty-nine spindles used for drilling all of the holes in the base of the crankcase, or in the top of the crankcase as shown in Fig. 12, there being a separate jig J with the necessary bush poles to receive the drills for the top and the bottom. To get accuracy and to be sure that these holes are drilled in proper relationship to the crankshaft bearing, it is necessary to locate this jig from the crankshaft. This is done by inserting in the crankshaft bearings an arbor with ends A exactly fitting into the bearings. The jig plate is then supported on this arbor by means of hanging yokes on the under face of the jig plate, these yokes spanning collars on the arbor these collars locating the jig accurately for endwise and sidewise positions. The face of the crankcase having been previously faced off in correct relationship with the crankshaft, the final word in accuracy so far as drilling the various holes for mounting the cylinders or attaching the crankcase base have been accomplished.

## Another Decision for Weed Chain

### New York Court Rules Against Gray

NEW YORK, Dec. 2.—A decision of great interest and importance has just been rendered by Judge Lacombe in one of the Parson chain grip cases brought by the Weed Chain Tire Grip Co. against Daniel S. Gray in the United States district court, southern district of New York. On December 1, the court ordered the sequestration and impoundment of infringing chain grips and parts for chain grips such as cross chains, cross chain hooks and tension members.

The moving papers that the cross chains and other parts were originally owned either by the Atlas Chain Co. or by the Federal Chain and Mfg. Co. of Springfield, Mass., which succeeded the Atlas Chain Co., and that the parts in question had been enjoined while in the possession of the Atlas company and latter while in the possession of the Federal company, but that in violation of the injunctions the parts had been transferred and finally came to New York, where they were being offered for sale by a dealer in second-hand machinery.

The complainants moved not only for an order impounding or sequestering the goods so that they should be held awaiting the final determination of the case, when presumably the complainants will ask that the goods in question be delivered up for destruction or be disposed of in some way that will effectively prevent their being used as parts of infringing devices. Below is the opinion of the court in full:

The power of the federal courts of equity to impound or sequester infringing goods and to compel their delivery up for purposes of destruction is well recognized, but it is equally well recognized that only in unusual cases will this remedy be applied. In the case in question it was shown that the parts were easily capable of being made into infringing devices and had been manufactured for that purpose and indeed that similar parts had been used by the previous owners for the manufacture of infringing grips. The difficulty of following these parts also was pointed out and it was urged by the complainants that the only effective way of preventing continued infringement by the use of these parts was that the same should be taken into the custody of the court.

The Parsons Non-Skid Co., Ltd., and the Weed Chain Tire Grip Co. have brought suit against Samuel Hollander, Morris Benjamin, H. I. Segal and Ephraim Noble for alleged infringement on tire armors, including cross chain hoops and tension members. The complainants, which are bringing the suit before the United States district court, southern district of New York, claim that the defendants are offering for sale dies and other apparatus specially designed and intended for the sole purpose of enabling others to enter upon the infringing, manufacturing and sale of such tire armor devices.

#### IMPORTANT TRADE MARK DECISION

Washington, D. C., Nov. 25.—What is regarded as one of the most important trademark cases brought before the United States supreme court in a decade has just been docketed in that tribunal. It involves, among other things, the question of whether a territorial limit exists on a trade mark which would prevent, for instance, a miller from using his rival's

trade mark in Ohio, but would not prevent him from using it in other states where the senior claimant to the trade mark did no business.

The Allen & Wheeler Co., of Troy, O., complains that the Hanover Star Milling Co. of Germantown, Ill., has infringed one of its trade marks on flour. The sixth United States circuit court of appeals held that the Ohio company's trade in this brand of flour was all north of the Ohio river, and that the Illinois corporation had built up a market for a brand under the name in Georgia, Florida, Alabama and Mississippi, not knowing that anyone else was using the same name.

Under such circumstances the court held that the protection of the Ohio company's trade mark did not extend to territory where it had no trade and refused to stop the Illinois company from selling the brand in the southeastern states.

#### REST OF R. C. H. ASSETS SOLD

Detroit, Mich., Dec. 1.—Although the entire assets of the R. C. H. Corp. were supposedly sold to the Harris Bros. Co., for \$268,000 at a recent hearing before Referee in Bankruptcy Joslyn here, bids on November 26 were received from the Lincoln Realty Co. for the real estate and from C. L. O'Hara and W. F. Baird for the personal property which aggregated \$295,000, and since the Harris concern did not care to equal this amount, the latter bidders secured the property. Messrs. O'Hara and Baird will dispose of the property, guaranteeing the trustee, the Security Trust Co., \$190,000 for their share, while the Lincoln Realty Co. is to pay \$105,000 for the real estate. O'Hara formerly was connected with a machinery

house here, while Baird is a prominent machinery broker.

Preferred creditors, whose claims total about \$270,000 and others who hold claims to the amount of \$24,000 will by the liquidation realize about 60 to 75 cents on the dollar, but those who signed off their claims with a view to getting all of their money back through continuing the business and putting the concern back on its feet a year ago will lose their entire accounts amounting to \$1,372,359.

#### PACKARD QUARTERLY DIVIDEND

Detroit, Mich., Nov. 28—The directors of the Packard Motor Car Co. have declared the regular quarterly dividend of 1.75 per cent upon the preferred stock, payable on December 15, to the stockholders of record upon the close of business on December 3. The transfer books of the company will be closed from December 4 to 15, both days inclusive.

#### MOTOR PLANT TO RESUME

Milwaukee, Wis., Dec. 1—The plant of the bankrupt Milwaukee Motor Co., 32d and Burleigh streets, Milwaukee, which has been closed since early summer, and was purchased at receiver's sale last week by the Chicago House Wrecking Co., Chicago, for \$86,000, will resume operation on January 1, 1914, according to W. J. Bennett, of St. Louis, representative of the Harris brothers who own the Chicago House Wrecking Co. It is the intention of the purchasers to operate the plant until it regains a profitable situation, and then dispose of it. The Harris interests will put on 100 men immediately and add more as needed.

#### HOLDS UP WALPOLE SALE

Boston, Mass., Dec. 1—The petition of creditors, representing \$900,000 of the \$1,269,000 liabilities of the Walpole Tire and Rubber Co., asking that the property be sold, was denied today by Federal Judge Dodge, who said that he would take no action in the matter until the report of the receivers stated that the property of the Walpole company could be operated at a profit.

#### GOODRICH DECLARES DIVIDEND

New York, Nov. 29—The B. F. Goodrich Co. has declared a regular quarterly dividend of 1.75 per cent on the preferred stock, payable January 1.

#### BRISCOES BACK FROM FRANCE

New York, Nov. 29—Benjamin Briscoe, who has been abroad for the past year with his brother, Frank Briscoe, perfecting a new car to be known as the Briscoe, arrived last Tuesday on the Carmania. It is the intention of the Briscoes to manufacture this car in the United States and France. It will be shown at the forthcoming show in the Grand Central Palace in this city.

## Other Tire Companies Reduce Prices Cut Made by Goodrich Met by Rivals

CHICAGO, Dec. 2—Nearly all of the big tire manufacturing concerns have kept step with Goodrich in reducing prices. Since the first gun was fired last week other interesting developments have been reported. Goodyear's new figures show that a 34 by 4 plain, that formerly sold for \$29.80 now can be purchased by the consumer for \$24.35, while the non-skid that sold for \$34.30 now lists at \$28.50. Tubes also have dropped, the 34 by 4 selling at \$4.90 instead of \$5.65.

Firestone has gone down 15 to 17 per cent on casings, with a more pronounced drop on tubes, which amounts to 20 per cent. Now the 34 by 4 Firestone plain sells at \$26.20 and the non-skid at \$30.50. A tube of this size now sells at \$4.90.

The United States Tire Co. has met the reduction in plain treads but so far the Chicago branch has not received the new list. Fisk, which makes forty-three different sizes, has a new list that ranges from 4 to 18 per cent lower than before. In general its new prices are about the same as Firestones. The drop in tubes is not so pronounced, however.

Michelin is standing pat, keeping to the new list it announced September 15. Nothing official has been heard from Republic.

#### SHAFFER QUILTS KEETON JOB

Detroit, Mich., Dec. 1—Harry S. Shaffer, former secretary and treasurer of the Keeton Motor Co., of Detroit, has retired from that company to become president of the Shaffer Motor Mfg. Co., of Alexandria, Va. This company will manufacture the Dunham motor designed and patented by Herman E. Dunham on the Pacific coast and brought to Detroit for experimental work many months ago.

#### HEXTER IN TRUCK DEAL

New York, Nov. 29—The Roland Gas Electric Vehicle Corp. was incorporated yesterday with a capital of \$200,000, to manufacture motor trucks in this city. The incorporators are Percy K. Hexter, R. R. Conklin and Stanley L. Conklin. The company has purchased all rights to the gas electric truck designed by Hexter. Mr. Hexter will be general manager of the new company. The company has obtained the large building at 336-342 Avenue B, corner of Twentieth street, which has been built and equipped as a modern motor truck service station. An initial output of 100 trucks will be started for the first year.

#### FORD BUILDING LOUISVILLE PLANT

Louisville, Ky., Dec. 1—Following the purchase of a plot of ground at Third avenue and the L. & N. railroad crossing, announcement was made yesterday

that the Ford Motor Co. has decided to establish a distributing agency for the south in Louisville. A building to cost in the neighborhood of \$200,000 and to be used as sales quarters and for assembling motor car parts for the southern trade will be erected. The property acquired by the Detroit concern has a frontage of 620 feet in Third avenue, 900 feet on the L. & N. tracks and 420 feet on the tracks of the Southern Railway.

#### PREST-O-LITE SUES AVERY

Milwaukee, Wis., Dec. 1—The suit of the Prest-O-Lite Co., Indianapolis, against the Acetylite Gas Co. of Milwaukee, Percy C. Avery, et al., charging unfair competition, is now being heard in the federal court at Milwaukee by Judge A. L. Sanborn, sitting in place of Judge Ferd. A. Geiger. The Acetylite concern engaged in the production of gas tanks and refilling about 8 months ago, following the expiration of the Prest-O-Lite patents on the well known system of motor car lighting by means of storage tanks.

#### SUIT AGAINST SWINEHART

New York, Nov. 28—J. Z. Love, Jr., W. A. De Long and J. W. Harriman, as trustees in bankruptcy of the New York Commercial Co., have brought suit against the Swinehart Tire and Rubber Co. in the United States district court of the southern district of New York. The suit involves an alleged breach of contract on the part of the defendants and the Cuyahoga Rubber Co. The complainants are asking for \$22,362.67 with interest on \$11,410 and \$10,948.07. It is claimed that the New York Commercial Co. entered into an agreement wherein it was agreed that this company would ship all lots of rubber which should be the subject of agreement for sale thereunder between it and the Cuyahoga company to its warehouse in Akron, O., and that the Swinehart company also entered into the same agreement.

#### STUDEBAKER APPOINTMENTS

Detroit, Mich., Dec. 1—President Fish of the Studebaker Corp. has announced the election of A. R. Erskine as first vice-president. Mr. Erskine retains his position as treasurer. James G. Heaslet becomes chief engineer and vice-president in charge of engineering and production; Ernest R. Benson, sales manager, as vice-president in charge of motor car distribution; Arthur I. Philip, assistant sales manager, as sales manager motor car division; Charles D. Fleming as assistant treasurer; and H. E. Dalton, as general auditor. These appointments were announced last week.



# John A. Wilson of Pennsylvania New President of A. A. A.

## Annual Meeting at Richmond Proves Short Session

**R**ICHMOND, Va., Dec. 2—Special telegram—Sixty-two accredited delegates are in attendance at the eleventh annual convention of the American Automobile Association, but despite the low attendance interest is at a high pitch. The first day's session continued from 10 o'clock until 6:30 last night and practically the entire business program for 3 days was crowded into one. The nominating committee, scheduled to report Wednesday, brought in its recommendations yesterday afternoon, and amid enthusiasm and with unanimity the following officers were elected for the ensuing year:

President—John A. Wilson of Pennsylvania.  
First vice-president—Dr. H. M. Rowe of Maryland.  
Second vice-president—Ralph W. Smith of Colorado.  
Third vice-president—F. L. Baker of California.  
Fourth vice-president—H. J. Clarke of Minnesota.  
Fifth vice-president—Preston Belvin of Virginia.  
Chairman executive committee—A. G. Batchelder of New York.  
Treasurer—H. A. Bonnell of New Jersey.  
Secretary—John M. Brooks of Connecticut.

Wilson steps up from first vice-president, succeeding Laurens Enos of Buffalo, while Rowe, Smith and Baker also are advanced a peg. Clarke and Belvin both are new blood among the title-holders. Batchelder, Bonnell and Brooks are re-elected.

President Wilson was escorted to the chair and thanked the delegates for their vote of confidence in his ability. He assured them he would be president and not a figurehead; that he would stand for criticism, but would not tolerate abuse. He said the members of the American Automobile Association, in undertaking the building of good roads, were like men planting vineyards, they do not expect to live to enjoy the benefits thereof, but the coming generation will profit by their labors.

The new executive committee was announced as follows:

Alabama, Dr. G. J. Griel; Arizona, George Purdy Bullard; California, F. L. Baker and P. J. Walker; Colorado, Ralph W. Smith; Connecticut, F. T. Staples; Delaware, John Bancroft; Georgia, F. C. Battey; Idaho, Theo. Turner; Illinois, Allen S. Ray and Henry Paulman; Indiana, P. C. Rubush; Iowa, G. Decker French; Kansas, C. W. Barnes; Louisiana, P. M. Milner; Maine, John C. Scates; Maryland, Dr. H. M. Rowe; Massachusetts, J. P. Coghlin; Michigan, W. E. Metzger; Minnesota, Asa Paine; Missouri, Royal D. Britton and H. D. Train; Montana, L. P. Mathewson; Nebraska, Harry Lowrie; Nevada, C. G. Patrick; New Hampshire, J. A. Reynolds; New Jersey, Dr. J. M. Faulkner; New Mexico, J. S. MacTavish; New York, Dr. H. Lewis and F. S. Webb; North Dakota, S. W. Richardson; North Carolina, Colonel Benham Cameron; Ohio, Harry Gordon and Harry Vaile; Oregon, W. J. Clemens; Pennsylvania, Stedman Bent and Paul C. Wolff; Rhode Island, C. N. Doe; South Carolina, Albert S. Farmer; Texas, C. S. Verschoyle; Vermont, E. C. Smith; Virginia, Preston Belvin; Washington, A. G. Pritchard; West Virginia, Elmer Hough; Wisconsin, J. L. Drought.

Boston was selected for the meeting place of the 1914 convention. It was said that the election of officers was brought forward to forestall an insurgent movement to elect another ticket.

The committee on resolutions reported favorably on four resolutions. The first expressed appreciation of the A. A. A. to Franklin K. Lane, secretary of the interior and Adolph C. Miller, assistant, for the development of the natural reservations and making them easier of access to tourists.

Second, that the association place itself on record favoring a plan of national government participation, which shall obligate the state in return for federal attention to its most used commercial highways, to expend a proportionate amount of money on these roads which directly serve the farming community.

Third, favoring the measure introduced by Representative W. C. Adamson, providing that after a car owner has registered his car in his home state he shall be privileged to go anywhere in the United States without additional registration.

Fourth, placing the association on record as opposed to the registration tax on motor cars unless it shall be in lieu of all other taxes and the money thus raised be expended on road maintenance.

An article signed by Dr. Heyl of Ohio charging that manufacturers of motor cars and accessories supplies control the A. A. A. was declared by Former President Hooper to be "an infamous lie" and the president was instructed to appoint a committee to try Dr. Heyl on a charge of treason.

The question of several state associations being in arrears to the national association for per capita tax was discussed briefly and will be considered in detail before the convention adjourns.

### Second Day's Session

Richmond, Va., Dec. 3—Special telegram—The A. A. A. convention adjourned sine die yesterday afternoon after the delegates had enjoyed a sightseeing tour of the city. At the business session the charges of Dr. A. B. Heyl, of Cleveland, were ignored, but it is probable that the executive committee will call Dr. Heyl to answer the charges he made that the association is controlled by motor car manufacturers.

Additional committeemen were appointed as follows: George C. Miller, Richard Kennendell, of Pennsylvania; Fred C. Pabst, of Texas, and S. A. Miles, of Maine.

George C. Diehl, of New York, was re-appointed chairman of the good roads committee, Howard Longstreth, of Pennsylvania, chairman of the committee on touring; and William Schimpf, chairman of the contest board. Mr. Ventiler, of New York, and Dr. Sweet, of New Jersey, were added to the executive committee.

Dr. Rowe, of Baltimore, offered a motion which was adopted that the association issue educational propaganda to teach

children how to avoid accidents and how to care for themselves.

Dr. Rowe said such instruction is now being given children in Baltimore and has been productive of much good.

### ANOTHER LONG RACE PLANNED

Dallas, Tex., Nov. 29—Arrangements are now being made for a speed contest in the near future over the all-Southern route from El Paso to Dallas, under the auspices of the American Automobile Association. This contest will be similar to the recent race from El Paso to Phoenix, and will be a demonstration of the practicability of the Roswell route as an all winter route, the race being arranged for mid-winter. The entrance fee for participants will be \$100 and 36-hour controls will be established at Roswell and Sweetwater. It is expected that the run from El Paso to Roswell will be made in 1 day, from Roswell to Sweetwater in 1 day, and from Sweetwater to Dallas in 1 day. The prize money will be distributed as follows: Fifty per cent of the Roswell prize money to go to the car making the best time from El Paso to Roswell, 25 per cent to the second best, 15 per cent to the third and 10 per cent to the fourth. The same proportion will be applied to cars making best time from Roswell to Sweetwater, and the same from Sweetwater to Dallas, but no car will be entitled to any prize money which does not make the entire trip. Eighteen entries are promised by El Paso and several by Roswell.

### SAN ANTONIO RESULTS

San Antonio, Tex., Nov. 27—The first day of the postponed card of the San Antonio Automobile Racing Association's was held last Sunday, being again interrupted toward the close by rain. Honors were about even between Louis Disbrow in his Simplex Zip and Ralph de Palma in his Mercer, although their personal meeting in a race yet is to be staged. Bill Chandler showed the best form of the others, with George Mason, Gus Monckmeier, Bill Endicott, John Raimey and one or two others displaying form.

Two bad spills in which George Mason and E. V. Rickenbacher escaped unhurt, the former after his car had gone over the bank and the latter after his car had turned over and pinned him under it, were thrills of the program, which was witnessed by a big crowd. The second day of the meet is scheduled for November 30.

#### Summary:

Mile time trials for track record, held at 50 seconds by Barney Oldfield—Simplex, Disbrow, :53; Staver, Monckmeier, :53%; Case, Endicott, 54%.

Six miles, class E, 300 cubic inches and under—Bill Chandler, Mason Special, won; George Mason, Mason Special, second; H. Ulbrecht, Case Suffragette, third. Time, 6:50.



Nine miles, class C, 301 to 450 cubic inches—Ralph de Palma, Mercer, won; George Mason, Mason Special, second; John Raimey, Case Tornado, third. Time, 8:33½.

Twelve miles, class C, 451 to 600 cubic inches—Louis Disbrow, Simplex Zip, won; Gus Monckmeier, Staver-Chicago, second; Bill Endicott, Case Special, third. Time, 11:29.

Exhibition drive by Louis Disbrow in Jay-Eye-See, covering two laps, mile and one-half, in 1:25½.

Free-for-all at fifteen miles in three heats for southern championship. Called off after five laps because of rain.

#### Disbrow Beats de Palma

San Antonio, Tex., Nov. 30—Louis Disbrow in his Simplex Zip today in preliminary heats and finals of free-for-all events thrice beat Ralph de Palma in the Mercer. On each occasion at the close of the 6 miles on the ¾-mile track Disbrow led by over half the length of the homestretch. In all classes the races were won on time better than 60 miles an hour. Bill Chandler, of the unfortunate Mason team, went over the bank in the first race of the afternoon, sustaining painful injuries. He is not regarded as dangerously injured, however.

#### RECEIVER FOR PLANHARD

Kokomo, Ind., Dec. 2—The Planhard

Mfg. Co., of Kokomo, has filed a voluntary petition admitting bankruptcy, and at the request of a majority of the creditors, C. H. Felske, who has been superintendent and one of the principal stockholders, was appointed receiver, to continue the business for the present. The company in its petition gave liabilities as \$36,197.20 and assets of \$3,680.02. The concern has been manufacturing accessories for some time past, its principal output being a carbureter.

#### ELEVEN IN NEW YORK RUN

New York, Dec. 3—There will be eleven competing and four official cars in today's 500-mile reliability run of the Motor Dealers' Contest Association. A. L. Newton, of the Buick company has entered eight cars, and the other entries include a de Dion, Oldsmobile, National, Oakland, Hudson and a Chandler. The run will last 3 days and will include Long Island, Connecticut and New York state.

Today's run will be on Long Island. The contestants will follow the north shore road to Port Jefferson, and then

on to Riverhead, the noon control. The journey homeward will be along the south shore. On the second day, Thursday, the tourists will invade Connecticut. New Haven will be the noon control. The run will be as far as Poughkeepsie on the third day.

#### MAP OUT TOUR OF FRANCE

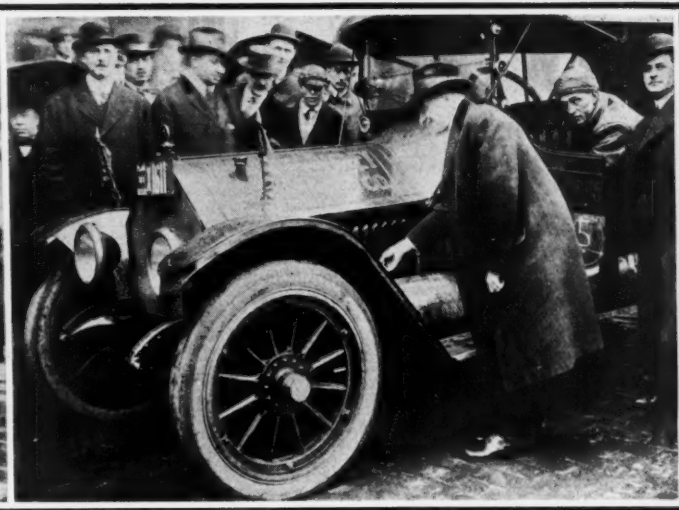
Paris, Nov. 15—Regulations for the tour de France, to be held from March 1 to 25, indicate a run of about 3,800 miles in thirteen distinct stages and on alternate days. On the open road the cars will be called upon to maintain an average speed of 19 miles an hour, all stops included, and to cover the full distance without the change of any essential part; practically everything on the car will be sealed to prevent changes. The daily runs will be alternated by a day spent in different towns.

#### LONG HORN SOLD

New York, Dec. 3—Special telegram—The H. W. Johns-Manville Co. has bought the manufacturing rights and stock of the Long horn.



START OF MITCHELL'S NON-MOTOR STOP RUN



JOHN H. DAILEY LOCKING BONNET ON THE MITCHELL

## Mitchell Light Six Makes Long Non-Motor Stop Run

### Covers 2,563 Miles in and Around Pittsburgh

PITTSBURGH, Pa., Nov. 29—The Williams-Hasley Motor Car Co., agent for the Mitchell, this evening brought to a successful completion a non-motor-stop test of a Mitchell light six which started at 12:35 p. m. last Monday and which ran until this evening, completing in that time a journey of 2,563 miles. In support of its contention the company offers affidavits of officials bearing out its claims.

The run was conducted over the city streets of Pittsburgh and on the roads within 200 miles zone of the city. The conditions were not at all favorable to the test either for on several days during the run the weather was rainy and the roads muddy. Notwithstanding this the

Mitchell kept running continually, its progress being watched with considerable interest by Pittsburgh motorists who had been stirred to enthusiasm by the strenuousness of the test. Every precaution was taken to satisfy the skeptics, the company going so far as to have John H. Dailey, director of the department of public safety, personally witness the sealing of the self-starter and himself locking the hood on the car and retaining the keys.

The first ten centuries were completed at 12 o'clock noon, November 26, when the odometer showed 1,005 miles. This was the mark the car started out to reach but at that time it was running so well

that the Pittsburgh agents decided to continue the test until Saturday night when a big banquet in celebration of the run was scheduled. The Mitchell kept running up until the time set for the banquet when the motor was stopped, although at that time there was every indication that the test could have been continued almost indefinitely.

W. G. Hasley was the driver to start the affair and he was assisted throughout the run by Frank Zerbies from the factory, who is well known as a reliability pilot. This is believed to be the first non-motor-stop test of a six-cylinder motor ever made in this country. The official observers were well known newspaper men.

# Saxon, a Newcomer, Invades the Low-Priced Field

**Chalmers Officials Back Enterprise, Although Two Corporations Are Separate—Harry W. Ford, President—Small Cars to Be Made to Sell Under \$400**

ALL mystery connected with the Saxon Motor Co. was cleared away with the announcement just made of its organization in Detroit for the purpose of building and marketing a two-passenger car to sell under \$400—probably \$395. The organizers make it a point that the Saxon is a small motor car of standard design and standard tread—not a cyclecar.

The new Saxon company is a Michigan corporation capitalized for \$350,000, of which \$250,000 is common stock and \$100,000 7 per cent preferred. Although the majority of the stock in the new company is held by men connected with the Chalmers Motor Co., the two corporations are entirely separate and distinct. The directors are: Hugh Chalmers, Lee Counselman, G. W. Dunham, H. W. Ford, C. A. Pfeffer, C. A. Woodruff, H. H. Pinney, C. C. Hinkley and Percy Owen. Some of the other stockholders in the company are: James Levy, of Chicago; John Shank, of Chicago; C. M. Steele, C. C. Cross, H. M. Wirth, J. T. H. Mitchell, of Chicago; John Nelson, Kansas City, C. F. Lott, L. R. Scafe, R. J. Goldie, C. F. Jamison, Carl M. Green, R. O. Gill, Charles Chalmers, of Philadelphia, and R. E. Cole.

The officers of the Saxon company are: H. W. Ford, president and general manager; G. W. Dunham, vice-president; L. R. Scafe, secretary and treasurer; H. M. Wirth, purchasing agent; C. C. Cross, factory manager; C. F. Jamison, sales manager; R. E. Cole, chief engineer.

## Personnel of the New Company

Mr. Ford, president and general manager of the company, has been connected with the Chalmers company almost from its inception. Starting as advertising manager, later he was elected a director and secretary of the Chalmers company. During the past 2 years he also has occupied the position of assistant general manager. He still will retain his directorship with the Chalmers company, serving in an advisory capacity in connection with the sales and advertising departments.

Mr. Dunham, the Saxon vice-president, has for the last 3 years been second vice-president and consulting engineer of the Chalmers concern. He is one of the pioneer engineers of the industry, having been connected with it from the time when it really became a manufacturing industry. Mr. Dunham still will devote his entire time to the Chalmers company.

Hugh Chalmers states that he will not be connected with the Saxon company in



SAXON SMALL CAR WITH TOP UP

## FEATURES OF SAXON

*Small car, not a cyclecar, to sell under \$400.*

*Four-cylinder 2½x4 motor.*

*Cylinders cast in block.*

*Vacuum-feed oiling system.*

*Sliding progressive gearset.*

*Left-hand drive and center control.*

an executive capacity nor as an official of the Chalmers company, but that his investment as a Saxon stockholder purely is a personal one. "I would not consider giving my time to any other company than the Chalmers Motor Co.," said Mr. Chalmers. "Nor would I make any investment in any company whose product in any way competed with that of the Chalmers. But I believe there is an absolutely new field that can be reached profitably by a car under \$400. I am convinced that the Saxon company has a good car at that price, and I believe that the price will appeal to thousands

who are not thinking now of buying the higher priced machines."

While the final organization of the Saxon company has just taken place, preliminary organization was effected some time ago, the engineering and other preliminary work having been carried on in offices specially secured for the purpose. The organization of the company is chiefly the result of the efforts of H. W. Ford, who has been convinced for a long time of the possibilities of a good two-passenger car at a low price—a car designed strictly as a two-person car embodying the main features of standard motor cars and not the features commonly associated with the cyclecar. He succeeded in interesting Hugh Chalmers and other associates in the project, with the result that the company has got under full swing with the minimum amount of preliminary effort.

## Designers of the Saxon

The general design of the car was laid out under the direction of Mr. Dunham, assisted by C. C. Hinkley. The actual detail work was under the supervision of R. E. Cole, the Saxon company's engineer.

"It is the aim of the Saxon Motor Co.," says Mr. Ford, "to concentrate on the production of a two-passenger car. This car is in no sense a cyclecar. While we have directed our efforts toward making this car as light as possible, we have in no way followed the practice of cyclecar designers. Our designers have followed the small car problem for a long time. We have watched the development of the small car in Europe and we believe that the greatest opportunity lies in the small car field rather than the cyclecar. We are able to build our car at the price for two principle reasons: First, the car has been designed from the very



REAR VIEW OF THE SAXON



beginning with the idea of building it economically. To this end we have worked toward eliminating all unnecessary parts and producing a good machine of utmost simplicity. Second, we are able to purchase our materials to the best advantage owing to our connections and the organization back of the car.

"We have no intention at present of branching out with a touring car line or any large line of small cars. We aim to stick to one thing and do it well. In our factory on Bellevue avenue, we have capacity for 10,000 cars this year. We will begin making deliveries March 1."

The Saxon car has a four-cylinder motor of the L-head type, with the cylinders cast in block and crankcase integral. The bore is  $2\frac{5}{8}$  inches and the stroke 4 inches. Valves are of generous size, with steel stems and cast iron heads. The crankshaft, of special drop-forged steel, is carried on two large bronze bearings, babbit lined. The camshaft is of drop-forged special steel, 1-inch in diameter with integral cams. It is driven by helical gearing.

#### Saxon Motor Details

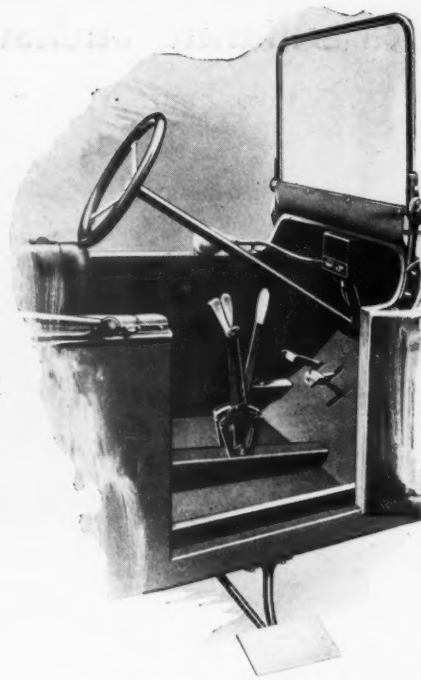
The motor is lubricated by a vacuum-feed oiling system with splash distribution. The cooling system is of the thermosiphon type with tubular radiator and fan. Ignition is by the Atwater Kent system, using six dry cells.

The gearset, which is carried on the rear axle, is of the sliding gear progressive type, giving two speeds forward and reverse. The drive is by shaft through a concentric torque tube, the drive shaft having one universal joint. The clutch is of the dry-plate type—three plates, steel on raybestos.

The axles of the Saxon are of standard type, the front being of the usual I-beam section. The rear axle is semi-floating with pressed steel housing. The outer end of the drive shaft is carried on Hyatt roller bearings. There are two sets of brakes on the rear wheels. The service brake is 8 inches in diameter, lined with heat-proof material. The emergency brake is of the internal expanding style, steel on steel. Both brakes have  $1\frac{1}{4}$ -inch face.

The Saxon is a left-hand drive car with control levers in the center. The throttle is controlled by a foot accelerator, while the spark control is placed on the dash. The steering mechanism is of the double-gear type with drop-forged steering connections. A 16-inch steel tube steering post is provided.

In body design the new car is very attractive. The two-passenger body is of the stream-



CONTROL SYSTEM ON SAXON

line type. There is plenty of room for two good-sized people, the seat being 40 inches wide and 16 inches deep with a 30-inch space between the heel board and the dash. The doors are 18 inches wide.

Other details of the car are channel-section pressed steel frame; standard tread; 96-inch wheelbase; and 28 by 3-inch tires on wire wheels. The weight of the car is 900 pounds and it has cantilever spring suspension, front and rear, the springs fastening to webs on the side of the frame. The clearance is  $8\frac{1}{2}$  inches at the lowest point. The car has a 6-gallon gasoline tank in the cowl. Its fuel consumption is said to be from 28 to 30 miles per gallon in ordinary running.

#### UTAH REACHES 4,000-MARK

Salt Lake City, Utah, Nov. 29—While the reports for the sale of cars in the United States have not been published for the season of 1913, it is doubtful if these reports will show any state to have made a greater percentage of gain than Utah. For years Utah has lagged away in

the rear in the annual sale of cars, white population being taken into consideration. Some of the southern states show fewer cars per capita than Utah, but this is on account of the large negro population in that section. Last season's record showed Wyoming, with a far less population, with more cars than Utah, Idaho and Montana with more, while Nevada had fewer cars but more per capita.

The season of 1913 has been a banner one and for this reason Utah probably will show a greater percentage of gain than any other state. At the beginning of 1913 there were about 2,700 cars in the entire state of Utah. The number passed the 4,000 mark—at the secretary of state's office, this week showing a gain of about 1,300 cars in the single year just passed. The 2,700 cars in use at the beginning of the year 1913 were sold over a period of 12 years, showing the number of cars have increased fifty per cent in the past year.

Poor roads are, generally speaking, the cause of the slowness of the people in general to take up with the motor car in Utah. It would be safe to estimate that at least 1,800 of the 4,000 cars now in Utah are in use in Salt Lake City. This is entirely contrary to the conditions in other states where the country and country towns far excel the largest city in the total number of cars used.

#### MILWAUKEE RELIEVING CONGESTION

Milwaukee, Wis. Dec. 1—To promote the safety of pedestrians and motorists in the downtown section of Milwaukee, the police department is trying the experiment of roping off parts of the busiest streets during the rush hours of street traffic. If the experiment is a success, the plan will be extended to cover the entire business district. The rope is stretched parallel to the street railway tracks near the street intersection, and provides a space of about 10 feet between the curb or sidewalk and the barrier for the passage of motor cars. Three feet are left between the barrier and street car for passengers, and patrolmen are stationed at the several points to see that none pass or repass excepting at certain periods, when motorists are halted for the sake of safety. At other times motorists have the right of way with traffic in either direction. Milwaukee at present has an ordinance which prohibits motorists from passing street cars which are taking on or discharging passengers, but this has caused many blockades. It is to facilitate motor traffic that the new plan is being tried out.



SIDE VIEW SHOWING GRACEFUL LINES OF THE SAXON

# Olympia, Majestic and Sultanic Jackson Models for 1914

## FEATURES OF THE JACKSON

*Few changes announced  
Again three models offered  
Two fours and a six  
Electric starter fitted  
Price reductions on all three models*

THE same three Jackson models are on the market for 1914 as were offered for this year by the Jackson Automobile Co., Jackson, Mich. These are the Olympic and Majestic four-cylinder types and the Sultanic six-cylinder model, the Jackson company using the method of designation by names rather than referring to the cars by number. Adhering closely to the same design throughout, the three show very little alteration either in chassis or in bodies over the 1913 cars, although prices have been reduced considerably.

### Olympic Has Starter for 1914

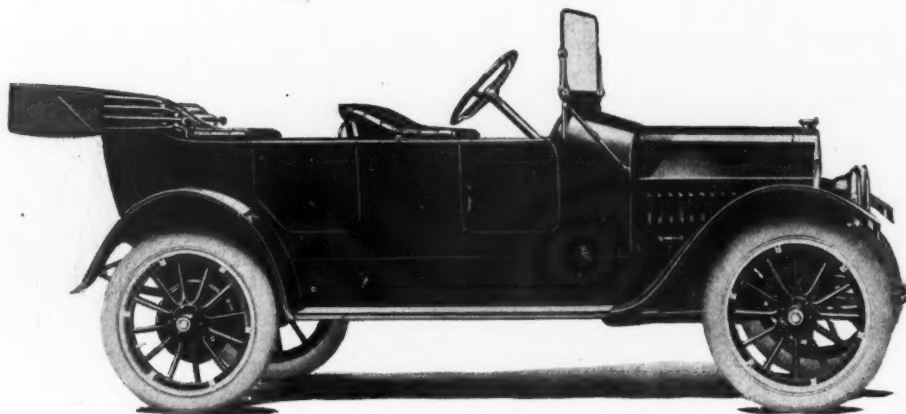
The Olympic, the smaller of the two fours, is, in the new edition, to be equipped with electric cranking and lighting of the same type as used on the other two models, and for 1914 sells for \$1,385 as against last year's figure of \$1,500 without this electrical apparatus. The Majestic four is now offered at \$1,885 as against the previous price of \$1,975, while the six has been materially reduced from \$2,650 for the seven-passenger and \$2,500 for the five-passenger edition to \$2,300 to \$2,150 for these two models, respectively.

Practically the only chassis change is the removal of the pressure gasoline tank from the rear of the chassis of the Olympic. On the 1913 models, there was besides a service tank under the cowl, a storage tank at the rear which carried the bulk of the fuel. The liquid was forced by pressure from this rear reservoir to the dash tank, going from the latter to the carburetor by gravity. On the new Olympic only the dash tank is used, feed being entirely by gravity. The Majestic and the Sultanic six, however, retains this two-tank construction as outlined above.

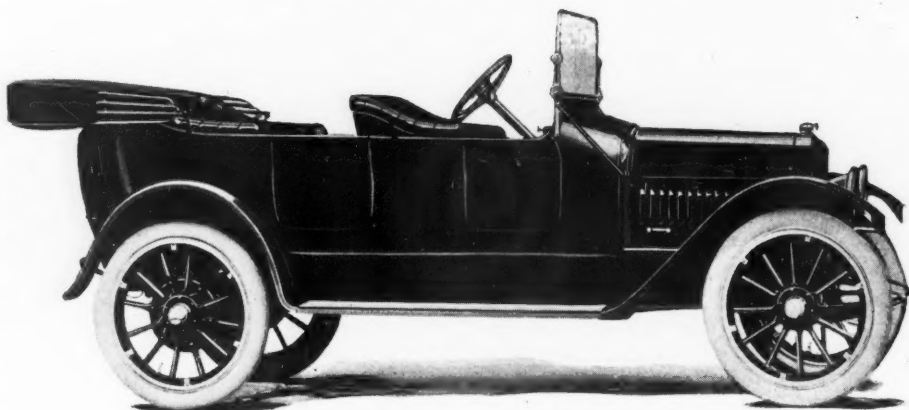
Slight body changes have been made, but as a whole the cars are still characteristically Jackson. Fenders have been given more of a curve to follow the wheels more closely, while the shallow boxes, which ran the length of the running boards heretofore, have been eliminated. The rounded radiator has been retained on the Sultanic and Majestic, although the Olympic still appears with a flat type of radiator.

The Jackson company is making the Olympic, the smaller of the two fours, the leader of its line for 1914. This car has a long stroke, L-head motor with cylinders cast in pairs, the bore of which is 4½ inches and the stroke 4¼ inches, giv-

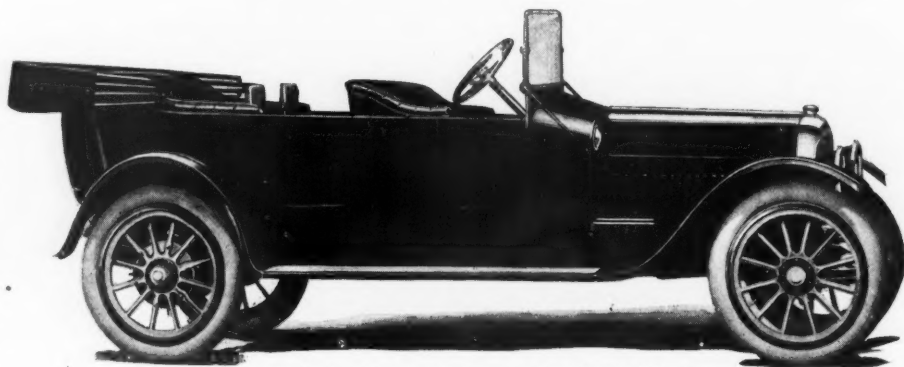
## Two Four-Cylinder and a Six Are Offered



OLYMPIC MODEL OF JACKSON LINE



MAJESTIC MODEL OF JACKSON LINE



SULTANIC SIX-CYLINDER JACKSON MODEL

ing an S. A. E. rating of 27.25 horsepower with a piston displacement of 253.9 cubic inches. Of course, this rating is low, and according to the maker, the actual developed horsepower is 40.

### Unit Power Plant Construction

The power plant is of the unit construction with the clutch and gearset housed within an aluminum case which is bolted to the rear of the flywheel housing through a substantial flange. Arms extend from this flywheel—including a portion of the crankcase to the side members of the frame, and there is a single support at the center of the front end of the motor. Thus the power plant is three-point suspended, allowing for any slight twisting

which might occur without putting any strain on the engine.

The motor design is conventional in every way and is a very good example of up-to-date standard practice. The gray iron cylinder castings bolt to an aluminum crankcase which is split horizontally, the main bearings being fastened to the upper half. There are three of these crankshaft bearings, which are of the plain type with die-cast babbitt surfaces. The camshaft also has three bearings and is driven through helical gears. The pistons are of gray iron, have three rings each and are fitted with piston pins of steel tubing.

The tungsten steel valves, all of which



are on the left side, are interchangeable, have the usual form of beveled seat and their stems and springs are completely inclosed by cover plates.

The cooling system is of the positively-circulated water type with the centrifugal pump located on the right side of the engine and driven by the same shaft as the low-tension magneto. The latter is back of the pump. Lubrication is by the force-feed system, the oil being pumped from a large reservoir in the base of the motor and forced to the bearings. An oil gauge shows at all times the quantity of oil being circulated.

The electric cranking and lighting system is made complete by the Jackson company, with the exceptions of the motor and generator, which are the Auto-lite. The electric motor and the generator are separate units and the cranking apparatus has a novel mounting at the front of the engine. The motor armature is placed vertically, the motor standing on end, so to speak, instead of resting horizontally as in usual practice. This electric motor is wired direct to the storage battery, which is a Willard 120-ampere-hour type hung under the tonneau floor.

#### Some Starter Details

A foot switch on the floor board operates both the motor and ratchet clutch which connects the starting motor to the engine. The armature shaft carries a spiral gear which engages a gear on a countershaft. Keyed to the countershaft is a sprocket which drives a sprocket on the crankshaft through a silent chain. The crankshaft sprocket carries one member of the ratchet clutch. When the starting switch is operated the other ratchet member—which slides on the splined starting shaft—is mechanically brought into engagement with the sprocket member, and the engine is cranked. As soon as the engine, by its own power, turns faster than the electric motor would drive it, the ratchet is disengaged automatically. When not in operation the ratchet is held out by a spring. With this construction, the starting system is disconnected entirely from the engine, except when it is actually cranking.

The generator is mounted on a bracket on the right front side of the engine above the magneto and pump shaft. It is driven by a silent chain from a sprocket mounted on this shaft at a speed 2.5 times as fast as the crankshaft speed. The system works at 6 volts, and a centrifugal governor limits the output of the generator to the requirements of the battery. In order that the battery cannot discharge back through the generator when the car is standing idle, a reverse current cutout is provided, which is of the magnetic type controlled by a voltage coil.

As already pointed out, the gearbox bolts to the rear of the crankcase. It provides three speeds forward, selectively obtained. The entire gearset is in accordance with standard practice, the power

coming back to it from a leather-faced cone clutch working in the flywheel as usual. Both gears and shafts are of special alloy steel, while ball bearings play an important part in the shaft mountings. The diameter of the mainshaft is  $1\frac{3}{8}$ -inch, while the jackshaft is  $1\frac{1}{4}$ -inch diameter. The stub shaft is provided with a roller bearing at its front end, lubricated through an oil passage in the shaft.

The spring suspension is at variance with that found in the average car of today in that elliptic springs are employed, front and rear. These rest on the axles and in the rear are outside of the frame. This method of frame support is said to give a very resilient action, making for easy riding. To further add to its free movement, the upper half of each rear spring is fastened to the frame at its center in a trunnion mounting.

Steering and control are on the left and appear with standard features. The wheelbase of the car is still 115 inches, and the tread 55 inches. Tires are 34 by 4 inches all around and are mounted on demountable rims. The equipment is complete at the price.

The larger four-cylinder Jackson, the Majestic, practically is the same mechanically as its smaller brother, into the de-

tails of the construction of which we have just delved. But though its motor is of the same design and type and has the same earmarks, the Majestic is rated by the maker at 45 horsepower since the cylinder dimensions are  $4\frac{1}{2}$  by  $5\frac{1}{4}$  inches. These give a stroke-bore ratio of 1.17, an S. A. E. rating of 32.4 and a piston displacement of 334 cubic inches. The cylinders are cast in pairs, the unit power plant feature is adhered to and valves are on the left. Ignition, cooling and lighting and starting systems are uniformly in accord in design and construction with these features of the smaller four which we have investigated.

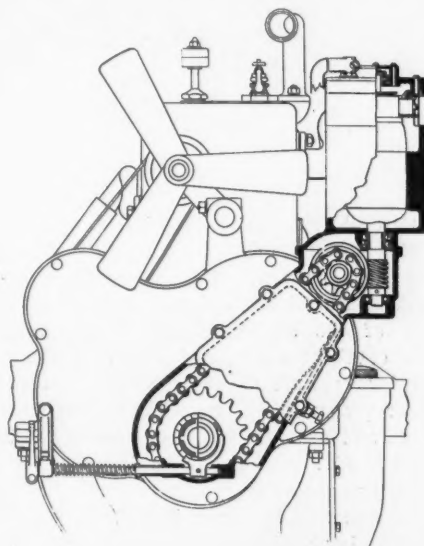
#### Method of Drive on Majestic

Unlike the Olympic, however, is the method of drive on the Majestic. An uninclosed propeller shaft equipped with two universal joints connects the gearbox with the final drive. A torsion rod parallels the shaft and radius rods are on either side running from a point near the ends of the axle housing to the side frame rails. Last year's semi-floating rear axle has been replaced by a floating construction.

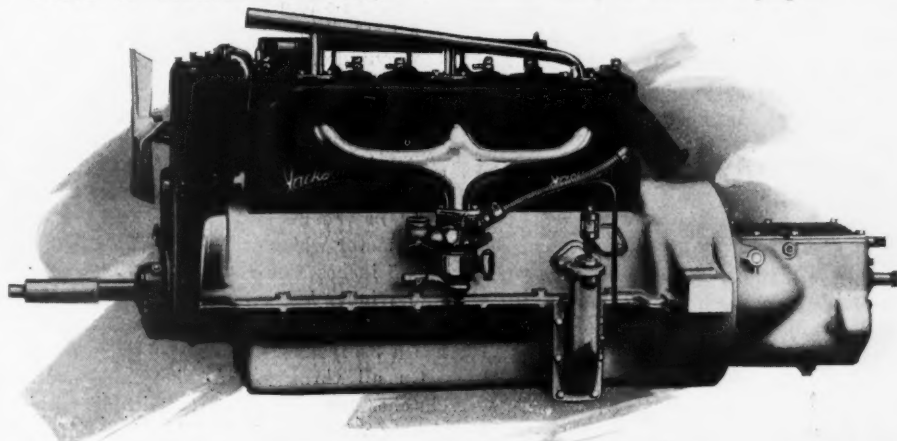
Outside of these differences, the Majestic chassis conforms in a general way to that of the Olympic, dimensions being different wherever necessary. The wheelbase of the Majestic is 124 inches, and its tires are larger than those of its smaller running mate, of course—36 by 4 inches. Its equipment also takes in everything needed for immediate road work.

The Sultanic is a big luxurious model on a 138-inch wheelbase in the seven-passenger style and a 132-inch wheelbase with a five-passenger body. It has a motor whose design conforms closely to that of its two partners. The Jackson company rates it at 55 horsepower, and with cylinders of the L-head type cast in pairs with a bore of  $4\frac{1}{8}$  by  $4\frac{3}{4}$  inch stroke.

The starting and lighting units are essentially the same as on the other two motors, while the gearbox having three-speed changes, also is housed in unit with the engine. Back of the motor the power is transferred to the floating rear axle through a drive shaft inclosed within a torsion tube, as on the Olympic.



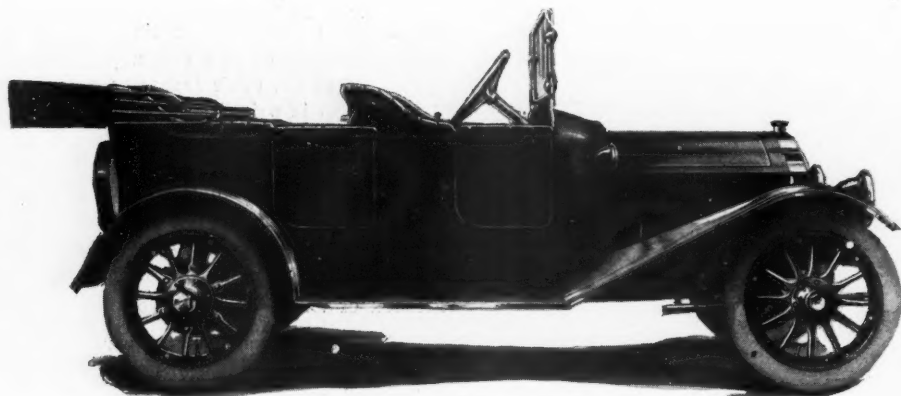
DRIVE OF STARTER ON JACKSON



LEFT SIDE OF SULTANIC MOTOR SHOWING CRANKING MOTOR AT FRONT END

# Marathon Offers Three Chassis and Six Body Types

Prices Range from \$925 to \$1495 for 1914



MARATHON WINNER TOURING CAR

**M**ADE by the Marthon Motor Works, Nashville, Tenn., the new Marathon line comprises three different chassis designs and six body types, a combination that should supply the demand for any type of medium-price car. The prices range from \$925 for the 25-horsepower to \$1,495 for the 45-horsepower. The intermediate for 35 horsepower is priced at \$1,325.

There are no radical changes made this season. The nomenclature of the models remains the same as last year, the largest being known as the Champion, the 35 as the Winner and the 25 as the Runner. Each of these types is offered in a roadster and a five-passenger touring car.

The prices of the Champion series have been reduced considerably from those of last season, as at that time they sold at \$1,750. Besides the price reduction an electric cranking and lighting system also is included in the equipment. A carburetor primer has been added to the different models for this year.

## Unit Power Plants on All

Considering the Marathon line in general, there are certain features of design which are used in all models. The power plant is a unit, consisting of motor, clutch, gearset and universal joint, all housed within an extension of the aluminum crankcase. The valves and valve rods are inclosed within removable side plates and are equipped with mushroom pushrods which receive the thrusts of the cams slightly off center so that they are continually revolving and the wear on the head is distributed evenly about the center. The material used in the cylinders and pistons is a close-grained gray iron ground to within close limits. The pistons are all provided with three eccentric rings, having lap joints and oil grooves. The aluminum casting work is done in the Marathan foundries and the crankcase with the extension needed for the unit plant is a barrel design cast in one piece.

## MARATHON FEATURES

Three chassis for 1914

Six body types

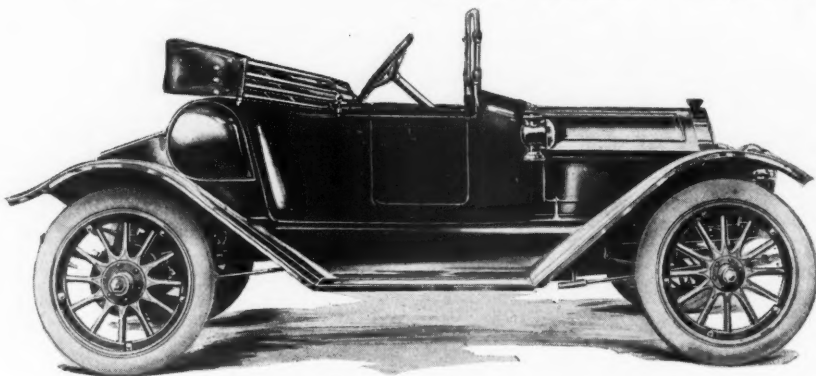
No radical changes

Price range, \$925 to \$1,495

Electric cranking and starting on the Champion

All motors four-cylinders

these plates are held in contact by three springs equally spaced about the peripheries. The combined tension of these three springs is equal to the tension which would be given by one large central spring around the main gearset shaft, the advantage being in the uniformity of the application of pressure. It requires a pres-



MARATHON RUNNER ROADSTER FOR 1914

Careful attention has been given to rendering the parts requiring adjustment accessible. To reach the bearings within the crankcase hand hole plates on the right side of the crankcase can be removed. The crankshaft bearings and connecting rod bearings are of white bronze die-cast under pressure. The bearings are scraped to fit and are not shimmed. An unusual feature of Marathon design in connection with the crankcase, is that the main bearings are supported upon it and not overhead as is practice in majority of motors. That is, the support of the crankshaft is from the bottom.

All the motors are of four-cylinders and the cylinders are cast in pairs. They are of the L-head type and carry the intake and exhaust manifolds on the right side.

## Motor Dimensions are Different

The dimensions of the motors of course vary in the different series. The Champion motor which is the largest has a bore of 4.5 inches and a stroke of 5.125 inches. The Winner has a bore of 4.25 inches and a stroke of 4.5 inches. The Runner motor has a 3.5-inch bore and a 4.5-inch stroke.

On all three models the multiple-disk clutches are used operating with oil within the fly wheel housing. They have fifteen saw-steel plates with ground faces, and

sure of but 12 pounds on the pedal to disengage the Marathon clutch.

The gearbox is a selective-sliding type furnishing three speeds forward. The main and jackshafts are mounted on New Departure ball bearings and for adjustment and inspection purposes a large plate is bolted over the top of the gearbox to permit of making adjustments without dismantling the power plant. The gear ratio on high or direct speed is 4 to 1, the reduction, of course, representing the gear ratio provided in the rear axle.

## Uses One Universal

The Marathon drive requires the use of but one universal joint, as the power plant is a solid structure back as far as the gearbox and the drive structure is solid also from the rear forward as far as this point. The universal connection here is necessary to provide for the differences in alignment of the drive due to spring deflections under varying loads and road shocks.

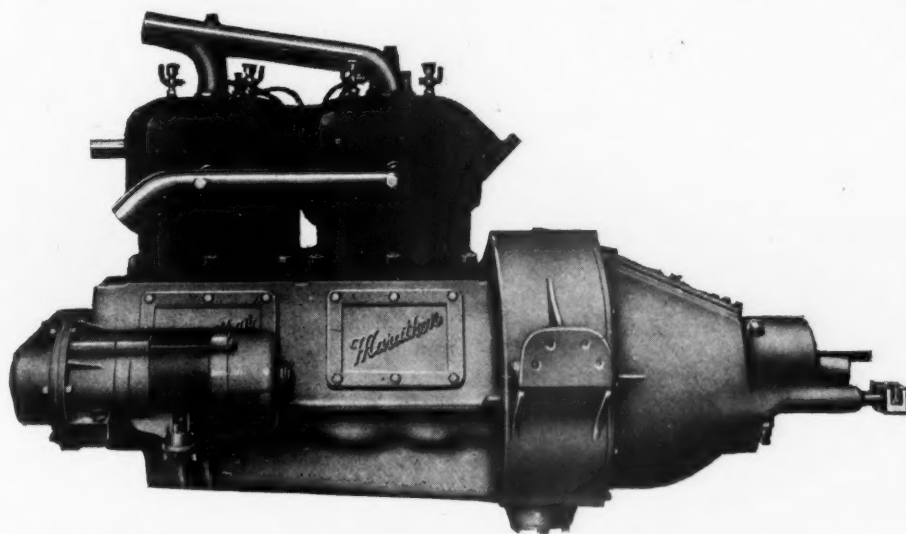
Floating axles are used on the Champion and Winner series, while on the Runner series a three-quarter floating axle is fitted. In all cases the entire weight of the car is carried on the axle housing. The drive is transmitted to the rear axle by bevel gear and pinion and the differentials can be readily reached through a large hand



hole through the differential housing.

Two sets of brakes which act directly on drums bolted to the rear wheels are used on all models. Both brakes are internal expanding and operate against the inner side of the same drum. The brake control is mounted in the customary manner, a pedal being used for the service brakes and a lever for the emergency. The brake bands are a composition of asbestos containing a re-inforcement of bronze wire netting. The brakes are fully equalized.

The wheels on all models are wood made in standard artillery design and running on double ball bearings. Demountable rims are fitted on all three chassis and on the Champion are equipped to take 36 by 4-inch tires. The Winner series takes a 34 by 4-inch tire and the Runner a 32 by 3.5. The front wheel spindles are large and the steering knuckles are mounted on hardened steel bushings having hardened steel pins. The tie rod is behind the dropped forged front axle. Elliptic springs with scroll ends are used at the rear on all three series. These springs are fastened at one point of the frame by means of oscillating perches which prevent undue strains of twisting of the springs from uneven roadbeds. The steering gear is a irreversible worm and full gear which has the two steering spindles located just behind and slightly above the front axle, permitting of a short turning radius and by turning the gear to new positions, full adjustment for wear in these parts may be made.



LEFT SIDE OF MARATHON MOTOR SHOWING ELECTRIC STARTER

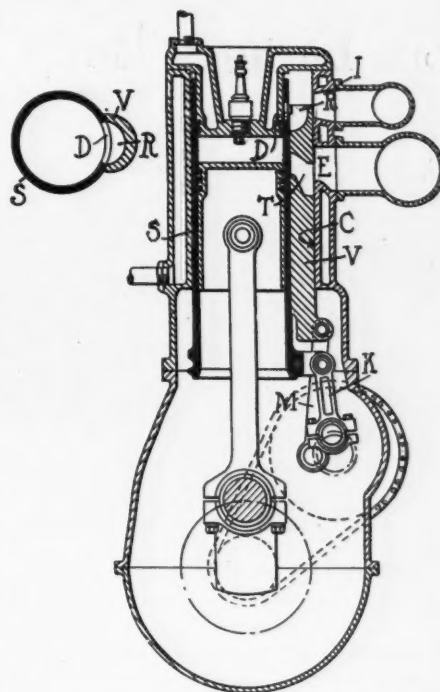
The Marathon frame construction consists of two heavy side members of carbon steel having a channel section. They are narrowed in front to cut down the steering radius and they are widened at the offsets for greater strength. A heavy drop is used over the rear axle on the two larger models while on the Runner series the frames are continued straight back. Reinforcements against racking stresses are provided by heavy gusset plates at the

corners and these are hot riveted with pneumatic hammers.

The body work and finish of the cars have been given special attention this year. A distinctive feature which marks the Marathon roadster is the cam-shaped gasoline tank used on the Runner and Winner series. The capacities of these tanks are 33 gallons. On the touring cars the tanks are from 15 to 19 gallons capacity and are located beneath the front seat. The cars are well finished, each having an application of from sixteen to twenty-seven coats of paint. Each coat is rubbed down with pumice and felt before applying the next coat. The standard color is a blue black with a light pearl gray stripe. The trimmings are nickel plated and black enameled. The equipment is complete in every particular, the price being an inclusive one. The wheelbase of the three models is as follows: Champion, 123 inches; Winner, 118 inches and Runner, 106 inches.

#### KNOX'S NEW NON-POPPET MOTOR

Harry A. Knox, general manager of the motor car department of the Lyons-Atlas Co., Indianapolis, has patented a new form of non-poppet motor which employs a sliding sleeve and a sliding plug, the former with one port and the latter with two, one for intake and one for exhaust. Both sleeve and plug are operated from a common shaft and in their movements cause the ports to coincide and thus permit gas to pass in or out of the cylinder. Since the sleeve is provided with only a single port the loss due to leakage is reduced to



KNOX'S NEW NON-POPPET MOTOR

ter the exhaust. The slide plug is operated by the connecting rod M attached the shaft shown, which is common also to the rod K for the sleeve. The sleeve and the plug move up and down, the former in an opening provided entirely around the cylinder and the latter in a vertical opening C. When the port D registers with the inlet passage R communication is established between the combustion space and the intake header I and thus combustible gas is passed to the cylinder.

In the illustration the piston is just starting on its power stroke and both ports of the plug are sealed. On the exhaust stroke the port D registers with the opening T and with the exhaust header E and so the exhaust gas may pass out of the cylinder.

The Knox engine differs essentially from the Knight engine used in Lyons-Knight cars, in that a sliding plug and one sleeve are used whereas the Knight employs two sliding sleeves one within the other.

#### BORLAND ADOPTS WORM BEVEL

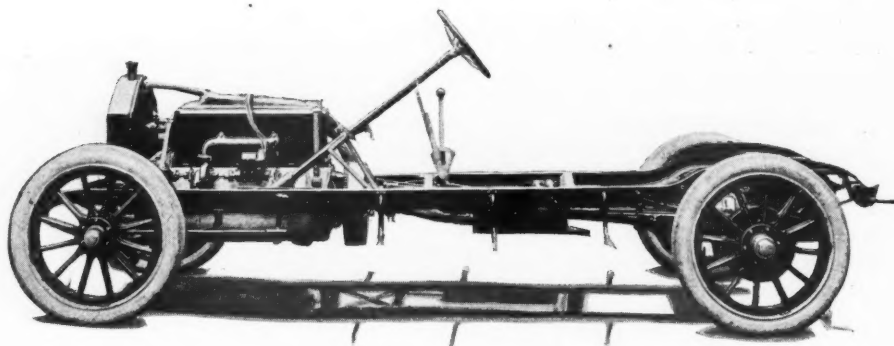
The Borland-Grannis Co. of Chicago, maker of the Borland electric, announces the adoption of a new type of rear axle drive, known as the worm-bevel, this type having supplanted the bevel on but one other make of vehicle, the Packard, which was announced in Motor Age, August 11. The Borland worm-bevel drive resembles the Packard creation in many respects. In this type of drive the gears are constructed with their teeth skewed and at the same time curved. In the worm-bevel one set of teeth is enmeshing while the set adjoining is disengaging, as against the limited contact obtained with bevels. Besides extreme silence other claims made are high efficiency, long life and increased passenger comfort.

a minimum and as the cool entering gases are drawn through this port after the hot exhaust gases have been expelled the tendency is for the port edges to become cool and thus hinder carbon deposits.

A vertical section of the Knox engine is shown herewith and it will be noted that the movable sleeve S with the single port D is operated by the connecting rod K. The slide plug V has two ports R and T, the former being the intake and the lat-

# Six Distinct Body Types in the Correja Line for 1914

Open Coach  
Styles a  
Feature of  
the  
Product



CHASSIS OF MODEL H CORREJA

Six-Cylinder  
Motor  
of  
L-Head  
Type

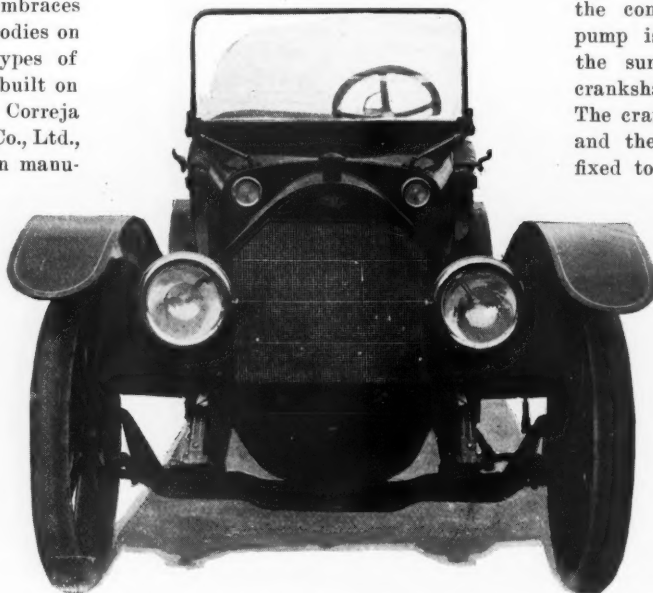
**M**ODEL H Correja for 1914 embraces three distinct types of open bodies on one chassis, and three distinct types of closed bodies on a heavier chassis, built on two different chassis designs. The Correja is manufactured by Vandewater & Co., Ltd., of Elizabeth, N. J., who have been manufacturing motor cars for the last ten years, and are producing 500 cars for 1914, which are handled by the Thomas Howard Co., of 319 Atlantic avenue, Brooklyn, N. Y., the sole factory representative.

The body equipment on the smaller chassis will be as follows: five passenger torpedo touring car model, which sells for \$1,800; six-passenger torpedo touring body, knickerbocker model, streamline, selling for \$2,100; two-passenger, torpedo roadster model, selling at \$1,800.

The equipment placed on these cars will include a full set of demountable rims, with extra rim carried in tire holders on rear of car; two large electric headlights, two electric dash lights, and one electric tail light; speedometer; robe rail and foot rail; electric horn; gasoline tank gauge; clear vision, two-pieced wind shield; mohair top with side curtains and envelope; complete set of tools, etc. An electric self-starter is \$150 extra. All parts finished in black enamel and nickel.

The motor is of the six-cylinder L-head type, with a bore of  $3\frac{3}{4}$ -inches and a  $5\frac{1}{2}$ -inch stroke, developing 52 horsepower at 1,600 r.p.m., cast in block. The valves are on the right side and are of large diameter, entirely inclosed with valve cover plates. The valve cover plates are accessible, and can be detached for inspection. The inlet manifold is waterjacketed.

The crankshaft is mounted on four bearings, the shaft having curved cheeks. The cam shaft is driven by helical cut gears, and is demountable through the front of the gearcase, making large bearings possible. All cams are integral with the shaft.



FRONT VIEW OF NEW CORREJA

## FEATURES OF CORREJA

*Three types of open bodies*

*Three types of closed bodies*

*Six-cylinder L-head motor*

*Motor size,  $3\frac{3}{4} \times 5\frac{1}{2}$*

*Two different chassis designs*

The magneto and generator shafts are mounted on ball bearings. The generator shaft drives the Ward Leonard lighting generator, and the magneto shaft drives the Simms high-tension magneto, and also drives a large centrifugal water pump, together with a large fan, placed in rear of radiator, is placed accessibly.

### Type of Lubricating System

In the lubrication scheme the combination piston pump, driven from the camshaft, forces the oil to all moving parts. A gauge is provided for observing the oil level in the crankcase, which is a lower compartment cast integral with the lower crankcase, which serves as a receptacle for carrying surplus oil. There is also a bull's eye glass gauge on the oil pump, to be assured that the oil is pumping at all times. Lubrication of the motor is on

the constant level splash system. The pump is used to circulate the oil from the sump to the splash chamber, and crankshaft bearings in the crankcase. The crankcase is divided into three parts, and the main bearings, four in all, are fixed to the upper half. These are oiled by the splash which fills up large pockets, cast immediately above all of the bearings. From these reservoirs the oil runs into the bearings through ducts. This splash also lubricates the pistons and cylinders and connecting rod ends. The bearing are fitted with bronze shell babbitt-lined bearings. The connecting rods are drop forged.

The starting gear housing is integral with the crankcase, the starting crank being easily detached. The drive is transmitted from the motor by a leather-faced cone clutch, of large diameter, with soft springs under the leather that can be adjusted without removing. A double universal joint connects cone clutch to the propeller shaft in front of the transmission.

The gearset is carried on the rear axle, with all drive shafts entirely inclosed, and contains gearing that affords three speeds forward. The primary and secondary shafts are mounted on annular ball bearings. The primary shaft is splined with a very large diameter. The levers for the gearshift are locked in the transmission case.

The propeller shaft is entirely inclosed in a tube having annular bearings, mounted at both ends, eliminating all use of radius rods, and torsion bars. The rear end of this propeller tube is riveted rigidly to a steel flange casting, which bolts to the forward end of transmission and terminates at the forward end into a steel fork, which is slipped on. Front and rear lock nuts eliminate all longitudinal thrusts. On each end of this fork is a hinged casting, which bolts on to a cross-frame member, making a solid, yet flexible unit.



The springs are semi-elliptic in the front and three-quarter-elliptic in the rear. The gasoline tank is hung beneath the frame in the rear of the axle, with steel brackets riveted to the frame. Rear axle and transmission are lubricated without disturbing the gasoline tank. The gasoline tank holds 18 gallons, and is pressurized. The tank is also provided with a strainer, and a gasoline gauge for observing the exact amount of oil at all times.

The wheelbase is 128 inches. The frame is of pressed steel, channel section, with 3½-inch kick-up over rear axle, permitting the car to be hung very low. Thirty-four by 4-inch tires are furnished and are carried on Baker demountable rims.

The steering is accomplished by a worm-and-worm wheel, rigidly bolted to the

main frame on the left hand side of the chassis.

Cooling of the water is accomplished by means of a centrifugal pump. The radiator is of the honeycomb type. Behind the radiator is mounted a 16-inch, eight blade fan, which runs upon ball bearings and is driven by a belt from the extension of the magneto drive shaft. A handy means for belt adjustment is provided.

The lighting is by electricity, generated by a dynamo bolted to the rear of the motor gearcase, and a 6-volt battery is floated on the line. The starting motor is bolted to the rear motor arm, and geared to the flywheel, and is operated by a foot pedal connected with a switch, making two contacts, the first to rotate the gear on the motor at slow speed for the engagement of the gears.

## Gray Improves Automatic Gearshift

### Combines It With Air-Cranker

**C**OINCIDENT with the appearance of the Gray pneumatic gearshift, much more compact and in improved form, comes the announcement that this arrangement is to be combined with a special air cranking system, the cranking and gearshift combination being applicable either to used cars or as factory equipment. The Gray system was designed by E. B. Gray and is being marketed by the Gray Pneumatic Gearshift Co., of Chicago. This company is a manufacturing and sales corporation operating under license from the Research Co., under whose auspices the system was developed and perfected. This system has just been adopted for the 1914 McFarlan.

The Gray pneumatic gearshifter in its original form has been explained in detail as to construction and operation in these pages but the illustration on this page shows the chief operating unit in its perfected shape, the one at the left being a ghost view which illustrates the working mechanism. The chief reason for the re-design of the system was to adapt it for combination with the cranking system and to make the combination more readily applied for installation on cars at present in use, as well as equipment on new cars.

Indications are that several 1915 models will adopt some form of gearshifting other than the hand lever. In bidding for attention the maker of the Gray apparatus points out that it is so light in weight and takes up so little space that it readily can be built as an integral part of the gearset. One connection to the air supply, a rod or cable to the clutch pedal and a connection with the selector shaft makes a very simple installation.

Details of the new Gray starting unit are just announced. From them it was developed that the chief portion is a reciprocating air motor attached to the crankshaft in front of the radiator. The manufacturer claims that it will turn most engines over

at 300 r. p. m. A two-cylinder compressor is integral with the starter and automatically contains any desired air pressure. A dash plate holds the gauge, compressor control, starter valve control, shut off valve and connection for tire inflation hose.

The following explanatory description will enable the reader to understand the operation of the latest Gray gearshift.

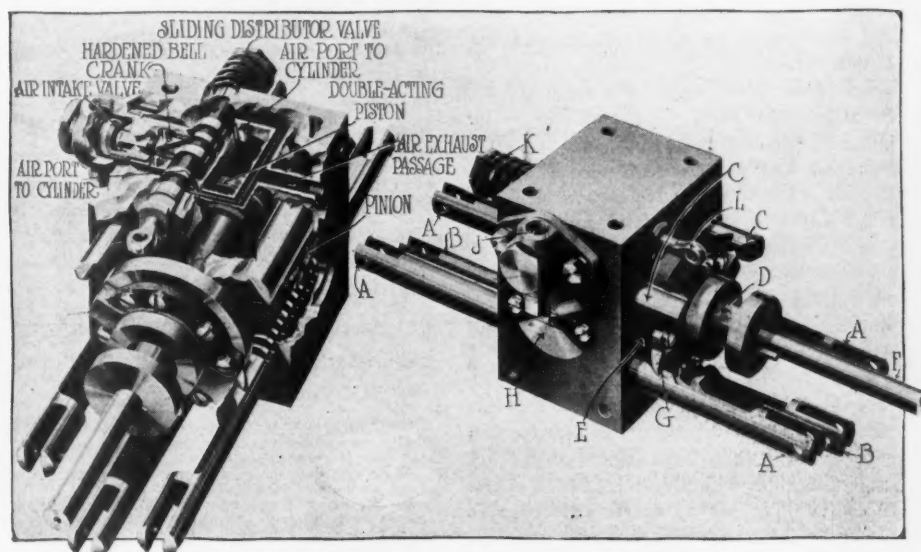
Two main shifting racks AA are attached to the gearshifting rods of the transmission. These racks are forced forward by means of the selector latch G operated by a double acting piston working in a cylinder bored out of the center of the main casting and make the two forward shifts on the ordinary three speed forward and reverse transmission. The

two backward shifts are made by engaging the selector latch with the idler shifting racks C. C. which when forced forward by the admission of air into the cylinder drive the main shifting racks backward by means of a pinion gear protected and inclosed by the cover plate H.

#### Operation of Gear Changing

The selector shaft F is connected to the selector quadrant on the steering post. The desired gear is selected by turning the selector shaft so that the latch G engages the rack operating the particular gear selected. Air is admitted at the intake J and enters the cylinder through a valve operated by cams on the distributing valve K. This sliding valve is drawn forward by depressing the clutch pedal to which it is attached by a cable or rod at L. A half depression of the clutch pedal admits air to the selector end of the cylinder at the instant the clutch is fully disengaged and forces all gears to neutral by means of the selector disk E. Both shifter racks are made with a shoulder which is engaged by the selector disk on the return movement of the piston and thus all gears are disengaged. The selector disk E is attached to the outer shouldered end of the piston rod by means of a threaded locking collar so that it can be rotated freely by the selector shaft F to which it is keyed and on which it slides.

The full depression of the clutch pedal exhausts the air and at the same time admits air into the other end of the cylinder, forcing forward the selector mechanism with the particular shifting or idler rack engaged by the selector latch. The illustration shows the position of the racks when all gears are in neutral with the selector latch G engaged in one of the shifting racks ready for a shift. B is a fifth shifting rack for four speed forward transmission.

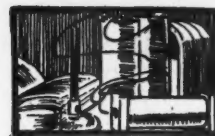


GRAY'S IMPROVED AUTOMATIC GEARSHIFT

The cutaway view shows the working parts of the Gray gearshift in exact relation to each other, just after a shift has been made and the clutch engaged. The sliding distributor valve is being pulled forward by a half depression of the clutch pedal—the ring cam has lifted the main intake valve by means of the hardened bell crank which will admit air into the forward end of the cylinder and the backward stroke of the piston will bring all gears to the neutral position.



# The Readers' Clearing House



## MOTOR CHOKES AT LOW SPEEDS Many Reasons Given for Common Disease —Horsepower Formula

MONTPELIER, IND.—Editor Motor Age—I have a 1913 Marathon, which has a Remy magneto and model O Schebler carburetor. The valve heads are 1 1/2 inches in diameter and the valve lifts are about 3/4-inch. The exhaust cams are just like the intakes, pointed on top. The gas line is clear. When the car is given gas it will hit on two or three cylinders for about 30 seconds, then it will run all right.

2—Will Motor Age kindly give a cure for a Marathon clutch, running in oil in flywheel housing, raking the gears? When it is loosened, it slips.

3—I have a Hupmobile 20 which stops suddenly for no reason I can find. I have new carbon brushes. When the car is stopped there is no spark. When the magneto is clean it will run for a while. It is covered up all the time and is a Bosch high-tension.

4—How can a non-vibrating coil be tested to see if it is dead?

5—What is the new way to find the A. L. A. M. horsepower?

6—What parts wear out on a carburetor?

7—Is Polarine a good oil for a Hupmobile?

8—Is a T-head higher compression than an I-head motor?

9—What kind of a seat is proper for a valve face?

10—Where is the best place to have an electric self-starter?—Leo Smith.

1—Provided you do not feed the motor too much gas suddenly the trouble may be due to a sticking air valve, poor valve tappet adjustment, spark plug gaps too wide or perhaps too narrow, or a leak in the intake manifold connections. These are the more common causes of interrupted firing under the conditions you mention.

2—Remove all the oil from the clutch housing and clean the plates well with kerosene. Then fill to level with new oil. If this will not cure the raking shorten the pedal throw so that the clutch releases farther.

3—See that the distributor cover of the magneto does not stand away too far. This cover may wobble a little when the engine is running and if the cover is not secure it may get far enough away from the instrument so as to hinder the distributor from making contact. Keep the spark plug gaps clean and adjust them to about 1/32-inch. See that the wires leading from the magneto are securely fastened and that the insulation is not broken. These wires are not housed and may rest against the hot exhaust pipe, thus burning the insulation and causing a short circuit. A few drops of kerosene on the breaker points once every three months is all the attention the magneto requires usually.

4—The ordinary coil is intended for 6-volt service. Attach the leads of a 6-volt battery to the terminals of the low-tension winding and then take the high-tension leads and hold them about 1/32-inch apart. If the coil is dead no spark will occur at the ends of high-tension leads.

5—The present S. A. E., or old A. L. D<sup>N</sup>

A. M. formula is, horsepower equals—, 2.5 where D is the bore in inches and N the number of cylinders.

6—The average carburetor has few moving parts usually the float and mechanism, and the throttle. These are the only ones likely to wear in service, but very few cases of worn carburetor parts are reported, usually poor adjustment or wear from improper handling being the ailment.

7—As far as Motor Age knows Polarine is a good lubricating oil for a Hupmobile.

8—The cylinder shape does not determine the compression. A T-head may operate at the same compression as an I-head or it may work at a higher or lower pressure. The same may be said of an I-head as compared with an L-head motor.

9—A 45 degree face, is in use on nearly all motors of today.

10—The best place for an electric cranker is the place where it will be most accessible and still do its work efficiently. Some makes of crankers drive the fly-wheel and others operate through the timing gears or by silent chain to some secondary motor shaft. These positions are determined by the design of the motor largely.

## CAUSE OF MUFFLER EXPLOSIONS Clogged Silencer Harbors Burning Gas— Unburned Ignited

St. Louis, Mo.—Editor Motor Age—I have a model 40 Moon 1912. In stopping my car it explodes in the muffler often when the engine is very hot. It seems that it explodes when stopping on dead center only—Edward Herhold.

Muffler explosions may occur whether the motor is on dead center or off center. The reason the explosion takes place in the muffler is because a volume of unburned gases pass from the cylinders to the muffler, which has not entirely disposed of the burned gases of the previous charge. Thus, an explosion takes place and the burned gases pass to the muffler, if no spark occurs in the next cylinder the gases will pass to the muffler unburned. Here the unburned gas meets the burning charge and hence an explosion will take place in the muffler. Sometimes an exceedingly hot muffler will ignite an unburned charge. If the muffler is taken apart and given a good cleaning the explosions may not occur.

## RACERS TUNED FOR HIGH SPEED Carburetor, Valves and Spark Not Set for Slow Work

Vancouver, B. C.—Editor Motor Age—What is the maximum speed of the Stutz raceabout, and the Mercer raceabout?

2—Why does a racing car miss its explosions at slow speeds?

3—Would a Ford run well if geared lower, and would it give enough more speed, if so geared, to warrant changing it?

4—Kindly give the addresses of the American branch of the Benz Motor Car Co., the Ohio Motor Co., and the Mercedes Motor Car Co.—A Reader.

1—The Stutz raceabout with a stock gear ratio of 2.8 to 1 is capable of traveling about 75 miles an hour, but higher speeds may be obtained with a lower ra-

tio. The Mercer is guaranteed to travel 75 miles per hour.

2—Because the valves, ignition and carburetor all are set for high-speed work and low-speed adjustments are ignored.

3—The 1914 Ford is geared 3.64 to 1 on high and if more speed is desired this may be obtained by dropping the ratio to say, 3 to 1 or 3.25 to 1. It would pay to lower the ratio to obtain more speed but this would invalidate the manufacturer's guarantee.

4—The Benz car is handled by the Benz Auto Import Co., New York, the Mercedes by the Paul LaCroix Automobile Co., New York. The Ohio car is made by the Crescent Motor Co., Cincinnati, O.

## PROBLEM OF BRAKING DISCUSSED T. M. Shields Uses Wrong Method According to a Chicago Reader

Chicago—Editor Motor Age—In a recent issue of Motor Age, I noticed a query from T. M. Shields as to whether it is advisable to put on the brake, without de-clutching. Motor Age replied in the negative.

Now, as a person who does a great deal of driving, and who also has occasion very often to teach others to drive, I would very respectfully like to disagree with this.

I think it can be safely said that 95 per cent of drivers use the foot throttle for driving, the hand throttle being used merely to determine the idling speed of the motor, and for very slow driving on high gear.

We will suppose that the hand throttle is so set that when the foot pedal is released the car will travel at a speed of 5 miles per hour on high gear. This is the usual setting on most six-cylinder cars. The car is traveling at, say, 20 miles per hour, a corner is approached which necessitates slowing somewhat, and foot pedal is released. The car immediately starts to drive the engine instead of the engine driving the car, and the brake then can be applied without de-clutching until the speed drops to 5 miles per hour, when of course, the clutch would be released. But as it seldom is necessary to slow down to 5 miles per hour, the usual and best method

## Questions Answered and Communications Received

Leo Smith.....Montpelier, Ind.  
Edward Herold.....St. Louis, Mo.  
A Reader.....Vancouver, B. C.  
Donald Herne.....Chicago  
A. D. Carpenter.....Sauk Center, Minn.  
Claude E. Nichols.....Bagley, Ia.  
A. B. C.....Grafton, W. Va.  
J. W. A.....Danville, Ill.

No communication not signed with the reader's full name and address will be answered.



is to just apply the brake without de-clutching.

The advantages are threefold. In the first place the engine already is acting as a brake and so assists the brakes, reducing wear. In the second place much wear is reduced on the clutch thrust bearing, and also on the clutch surface, as many drivers have a bad habit of racing their engines when engaging the clutch to pick up speed again, on high gear. Thirdly, it keeps the mixture more or less constant, this having a tendency to be somewhat upset when the engine is suddenly thrown idle and the load taken off. It might also be cited as an advantage that less muscular effort is required on the part of the driver.

To sum up. At all times when the momentum of the car is driving the engine instead of vice-versa the best practice is to use the brake only until the speed is so reduced that motor and car speeds balance up, and this, in the case of average wheel throttle settings, is about 5 miles per hour. Below this speed, and when stopping, it is necessary, of course, to de-clutch.—Donald Herne.

#### MAKE-AND-BREAK IGNITION BEST? States System Is More Satisfactory Than High-Tension

Sauk Center, Minn.—Editor Motor Age—Since writing the article on plugs some weeks ago, I have continued my experimenting along this line and find there is a vast chance for improvement in the spark-plug as presently made. While I like the jump-spark system, I am inclining to the make-and-break as a demonstration almost won me to it. Some of its advantages are that oil or moisture will not cause it to miss an explosion, while it can be set to intensify the spark or weaken it, at your pleasure.

I find the jump-spark is faulty because

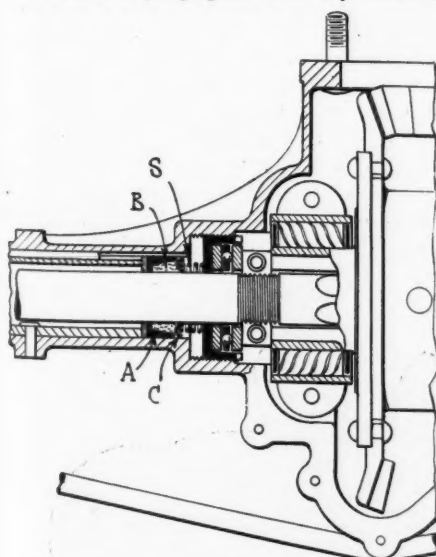


FIG. 1—SECTION OF OVERLAND REAR AXLE

Leaking of grease upon the brake bands is prevented by replacing the felt washer B, which is backed by the metal washer C and the spring S

of its liability to miss-fire by reason of carbon, oil, moisture of any kind, points too close together or points too far apart, while the cracking of porcelain means a new plug.

The jump system is more simple than the make-and-break, but when an engine has a trifle too much oil and uses the splash system, missing will occur in the best arranged engine manufactured. This as a matter of fact, causes a very serious and probably unconscious loss of real money, as any motor will not wear as long with first one cylinder and then another missing, nor will you get the rated horsepower or joy and comfort.

Some time ago I was asked to look over a high-powered motor and see if I could find the real cause of a bothersome missing on a certain cylinder. I carefully took it out upon the road and tried it out. The motor was in the pink of condition with the exception noted, and it really did for a time seem that I could not locate the real cause of the plug's missing. It seemed alright under tests but when put to hard work it would jerk and miss badly. I finally concluded to let the owner have a new plug of standard make, and upon placing this in the faulty cylinder the missing promptly was gone. Asking the owner for the old plug I took it apart and found the inner porcelain was broken off just below the gasket, and this was the cause of a short-circuit and no spark at the time when needed. As strange as it may seem it would spark when it was taken from the cylinder head and a contact made. A small crack in the porcelain will cause the current to flow in an entirely different direction than desired, and this same crack may be so small that it is not noticed by the naked eye. This fully shows the real weakness of the jump-spark system and a perfected make-and-break system, along the lines employed on some of our leading stationary engines, would be mighty welcome to us who have had oceans of experience with the tricky spark-plug.

The make-and-break is a very positive method of ignition and as used in one motor car that I experimented with, was, I thought, as perfect as human skill and materials could combine. Under the most severe test not a single miss was recorded, and the motor pulled well. American engineers are not to be outdone, and to them lies the task of making a reliable make-and-break system.—A. D. Carpenter.

#### GREASE UPON OVERLAND BRAKES Leaks From Differential Case—How to Remedy the Trouble

Bagley, Ia.—Editor Motor Age—I have a 1913 Overland and would like to know how to prevent the grease from working out through the brake bands on the rear wheels. The left wheel is covered continually with grease which has worked its way from the differential housing.—Claude E. Nichols.

A crosssection of part of the Overland rear axle is shown in Fig. 1. By replacing the felt washer B, the grease leaking

will vanish. The metal cup A has a conical inside surface as shown and retains the felt washer, which is held in place by means of the steel washer C and the spring S.

#### WEIGHTS AND MOTOR DIMENSIONS

##### Four Makes on the Scales—Paige Uses Disco Starter

Grafton, W. Va.—Editor Motor Age—What is the weight of the Buick B-25 touring car?  
2—What is the bore and stroke of this motor?  
3—What is the weight of the 1914 Overland touring car?  
4—What is the bore and stroke of this motor?  
5—What is the weight of the 1914 Studebaker four touring car?  
6—What is the bore and stroke of this motor?  
7—What is the weight of the Paige 25 touring car?  
8—What electric system does this model have?—A. B. C.

1—The Buick touring car model B-25 weighs 2,354 pounds.

2—The motor has a bore and stroke of 3.75 by 3.75 inches.

3—The Overland weighs about 2,000 pounds.

4—The bore and stroke of the 1914 Overland is 4½ by 4½ inches.

5—The Studebaker four weighs about 2,300.

6—The motor dimensions are 3½ by 5 inches.

7—The Paige 25 weighs about 1,800 pounds.

8—This car is equipped with a Disco electric cranker for 1914.

#### DATA ON FIXED SPARK IGNITION

##### Some Engineers Believe This to Be Best for Small Motors

Danville, Ill.—Editor Motor Age—What is the advantage or disadvantage, if any, of the set spark over the variable spark in a motor car?

I have in mind two or three popular-priced cars that use the set spark. These same cars seem to enjoy a very good reputation. One maker advertises that the set spark is best for both the novice and experienced driver alike.

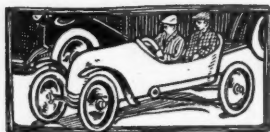
2—Can one get the set spark to pick up speed quickly on a grade or hill?

3—Is a set spark really a disadvantage?—J. W. A.

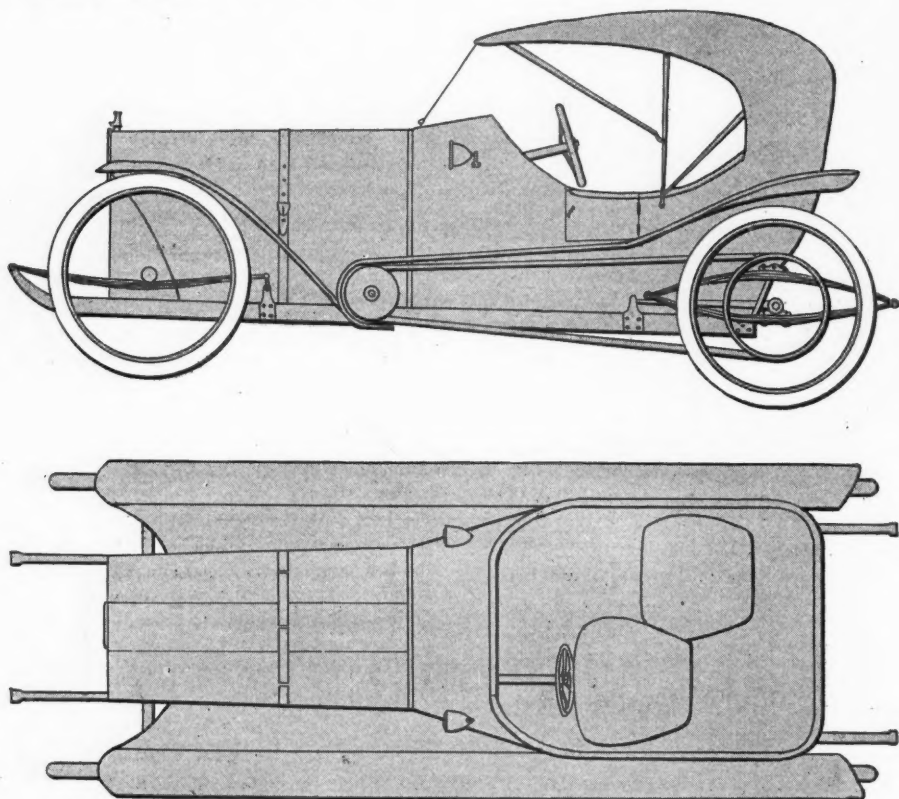
1—Some engineers state that for small motors of under 30 horsepower the set or fixed spark is to be desired. In the fixed spark, besides eliminating a few parts, no attention is required by the operator of the car, hence the driver becomes more efficient. Simplicity always being a feature makes the fixed spark desirable for this reason. The disadvantages usually set forth are that with the fixed spark the maximum motor efficiency never is obtained; that with the variable spark the time of spark occurrence may be governed according as the speed of the motor. Thus with the variable spark the explosion may be made to take place at a point of maximum compression and so the greatest efficiency obtained. However, causing the driver to regulate the spark not only takes his mind from the road, but may cause him to use the spark lever indiscriminately.

2—Yes, if the system is a well-designed one and the motor, etc., in good condition.

3—The set spark is not a disadvantage.



# Cyclecar Development



TWO VIEWS OF CANADIAN BABY CYCLECAR

## A CANADIAN CYCLECAR ANNOUNCED

**F**OLLOWING the lead of England and America, Canada announces a new cyclecar called the Canadian Baby. Work was started on the cyclecar in October, 1912. Two experimental cars have been built, the third car is now building. The chassis is made of  $2\frac{1}{4}$  by  $1\frac{1}{2}$ -inch channel steel, rear spring-holder drop-forged, front spring half-elliptic, rear spring elliptic, adjustable thrust rod for adjusting belts, ball joints, direct drive from twin-cylinder engine to Eclipse clutch, two speeds forward, left drive, seats staggered side by side, tool box at the back of driver, gasoline tank in hood near dash, electric headlight inserted in dummy radiator, electric side and tail lamps. The weight is about 425 pounds. This cyclecar will be sold in Canada, equipped with lamps, horn and top, at \$495.

## FALCON SPRINGING

The complete details of the spring suspension of the Falcon cyclecar show the ingenuity with which the designer, F. R. Hoyt, has made provision for the problems peculiar to this type of vehicle. The front axle construction, is made possible by a bracket of novel design. This bracket gives a single point of suspension for the frame, and permits either front or back wheel to be elevated without altering the level of the frame. Road shocks to

a single wheel are thus confined to the axle and not transmitted to the frame.

From the frame there extends forward a swan's neck steel piece or bracket terminating in a long socket which provides the bearing for a king bolt and fork. The fork carries a casting between its jaws, on a horizontal pivot. To this casting are fastened two sets of parallel springs, of two leaves each. This bracket construction is a new departure in design. Each main spring is shackled to the other at both ends, and the spindles are formed integral with the shackles. The movement of the axle in steering is controlled by means of steel cables from a sprocket and chain operating from the end of the

steering column. When one wheel hits an obstruction, the axle consisting of the two springs, rocks in the fork and the springs combine to take care both of the shock and the recoil.

The rear spring is a reversed cross arch. To either side member of the frame, which is of seamless tubing, a bracket is fastened, the upper end of each being shackled to an end of the rear spring. This leaves the frame of the car at axle-level, while it gives, in combination with the front bracket design, a three-point suspension for the entire frame. Frame distortion is impossible, either from road conditions or if a single occupant drives.

## DUDLY ON THE ROAD

The Dudley cyclecar of Menominee, Mich., has been on the road for several weeks and has surprised its builders by its performances. The car is made with semi-tandem seating, strong ash underslung frame, cross-spring suspension, V-type air-cooled De Luxe motor and planetary gear-set. The final drive is by belts. Deliveries to agents are announced for about January 15. The car is fitted with a pleasing body design, and the usual tread of 36 inches is fitted. It is made by the Dudley Tool Works.

## DETROIT FORMS A CLUB

The Detroit Cyclecar and Motorette Club has been formed. F. Ed. Spooner is president of the organization, J. P. LaVigne, LaVigne Cyclecar Co., first vice-president; J. J. Batterman, Scripps-Booth Cyclecar Co., second vice-president; C. F. Gazeley, Detroit Commercial Axle Co., third vice-president; I. N. White, Princess Cyclecar Co., fourth vice-president; P. A. Teats, P. E. T. Cyclecar Co., secretary; R. C. Albertus, Mercury Cyclecar Co., treasurer. These officers with the following comprise the board of directors: K. L. Herrmann, Herrmann Cyclecar Co.; W. J. Marshall, Mercury Cyclecar Co.; Ernest Weigold, Detroit Cyclecar Co.; J. F. Wilkinson, Wilkinson Starter Co.; S. A. Clinton, Detroit Cyclecar Co.; James Scripps



DUDLY CYCLECAR, MADE IN MENOMINEE, MICH.



Booth, Scripps-Booth Cyclecar Co.; A. J. Farmer, Farmer Mfg. Co.; Theodore F. Millington, Detroit Body Co.; H. S. Baker, Hinchman and Baker and P. Heseltine, Gadabout Motor Co. The organization started with nearly forty members. Detroit now has over thirty-one cyclecar companies in course of actual building or organization and practically as many companies manufacturing parts in great quantities to meet the demand for home and outside consumption.

The Chicago Cyclecar Club already has been organized and similar organizations now are being started in other cyclecar centers throughout the country.

#### COLUMBUS WILL HOLD MEET

The Columbus Automobile Club of Columbus, O., is promoting a cyclecar race to be held early in the spring on the track of the Columbus driving park. The date for the meeting which will consist of 2 days' racing will be fixed later and will take into consideration the wishes of the manufacturers of cyclecars both in the United States and foreign countries.

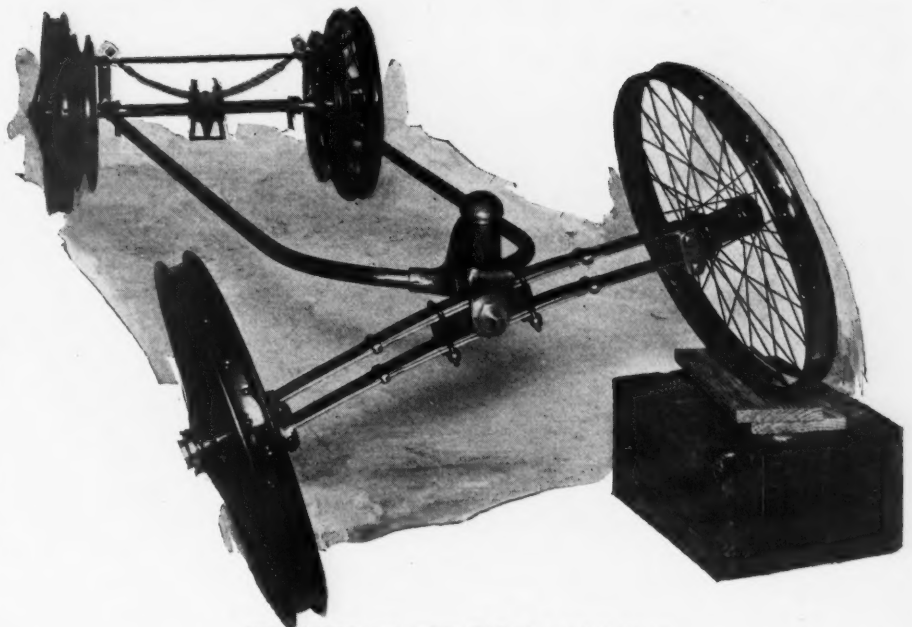
It is planned to have a number of races ranging from 5 to 25 or 50 miles in length. Classes will be arranged for the various cars entered. The arrangements for the meeting are under the charge of the contest board of the club of which L. M. Browne is chairman.

#### COIL SPRINGS FOR CYCLECARS

The Cyclecar Spring Co., Canisteo, N. Y., is engaged in the manufacture of coil springs for cyclecars, manufacturing several styles of these adapted for the different makes.

#### PROMISES EARLY DELIVERIES

The Mercury Cyclecar Co., of Detroit, has leased a well-equipped plant at 807-815 Scotten avenue, where a considerable force is kept busy assembling Mercury cyclecars. The company announces it expects to begin deliveries this month.



SPRINGING ON THE FALCON CYCLECAR

## Answers to Cyclecar Inquiries

### OUTLINES HIS CYCLECAR THEORIES

#### William Landis Asks Motor Age's Advice Before Building Machine

HARRISBURG, PA.—Editor Motor Age—I am planning to build a cyclecar and want the candid opinion of Motor Age regarding the specifications before I buy anything. The passengers are seated tandem, the wheelbase is 105 inches, tread 36 inches, cantilever springs in rear, springs and front axle combined as in the Imp cyclecar, twin-cylinder, motorcycle motor, friction transmission with 12-inch disks, 1½-inch V-belt drive from jackshaft to rear axle. The rear axle is tubular, 28 by 2½-inch wheels and tires, 8-inch ground clearance, gas and oil tanks in front of dash over transmission, foot brakes on rear pulleys. I would like to ask the following questions:

- 1—What would Motor Age suggest as an arrangement of the steering mechanism of this car? It cannot be like that of the Imp as I intend putting a fan on the motor.
- 2—Is 1-inch by 6-inch basswood strong enough for the frame with this wheelbase?
- 3—Will it be all right to leave the front and sides of the hood open as in the drawing?
- 4—There is a space of 3 feet from the back

of the seat to the footrest for each passenger. Is this sufficient?

5—Will this car be too heavy for the engine if the body is made of 22-gauge sheet steel?

6—Will a 6-horsepower twin engine be large enough?

7—How much room should I allow above the rear axle to provide for the spring action?

8—There is about 7½ feet between the pulley centers. Is this too much?

9—Will the rear springs be strong enough if they are 36 inches long, 1½-inch wide and consist of four leaves?

10—Please describe a mechanism for shifting the jackshaft for clutch action.

11—What should be the size of the jackshaft and rear axle for this width frame?

12—Please illustrate a good way to make the clutch and brake pedals. I have access to a forgeshop, moulding room, and machine shop.

13—What size are the jackshaft bearings and what make should I use?—William Landis.

The description of your proposed cyclecar sounds exceptionally good and with proper workmanship should make a very good car for your use.

Arrange the steering gear as shown in Fig. 1 running the ¾-inch steering pillar over the motor with the spools for a steel cable keyed at its lower end. Below this arrange two pulleys in a frame that fits, the cable running around these at a level with the steering arm, and out to connect as shown. The arms are connected with a cross rod R. The small drawing shows a detail of the pulley guide for the cable which may be made of sheet metal to prevent any possibility of trouble through the cable jumping off these pulleys. The rest of the construction is easily understood from the drawing. One warning, however—use only steel piano wire cable, not iron wire cable. This should be ¾-inch in diameter and fitted in duplicate. The steering spool or pulley S should be about 2 inches

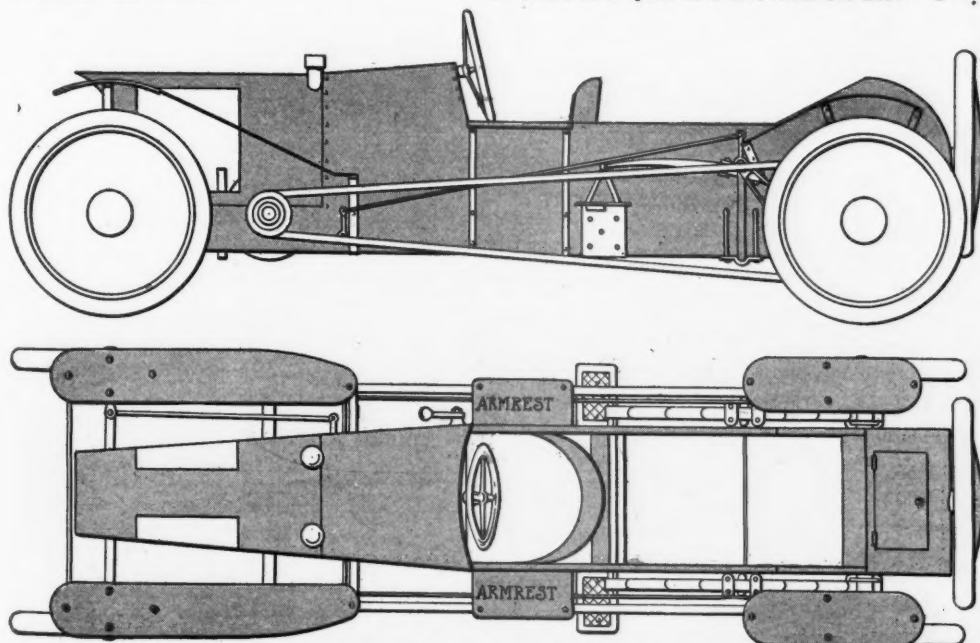


FIG. 4—SHOWING W. C. LANDIS' IDEA OF A CYCLECAR

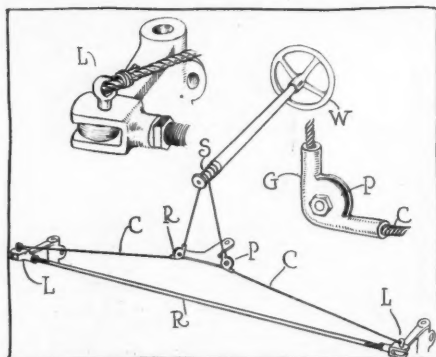


FIG. 1—HOW TO ARRANGE CABLE STEERING FOR CYCLECAR WITH STEERING PILLAR ABOVE AXLE

in diameter. Fit the fenders to the wheels, not the body.

2—Spruce of the same size will give better satisfaction.

3—Yes. Run floor under friction assembly, however, to keep out dust.

4—Allow about 42 inches for each passenger from the toe position to the back of the seat. If the seat is low to the floor the front seat should be adjustable. Fig. 2 shows a diagram with dimensions and possible layout.

5—The gauge is right.

6—Yes, but unless specially made the main shaft probably will be too light. A motor built for the purpose should be used if possible.

7—Allow at least 4 inches of spring action above normal load.

8—No, the longer the belt the more efficient and the longer lived it will be. This already has been proved.

9—Give the spring maker the dimensions of the spring under load, the type of the eye and the deflection per 100 pounds, leaving the number of leaves and other dimensions to him.

10—Fig. 3 shows a method of moving one end of the jackshaft by pivoting the annular bearing B with a lever L which is pivoted to the frame at P. The dust caps C, shown in section, are meant to be secured on either side of the bearing casing. Pulling on the lever below will force the jackshaft towards the friction disk as shown.

11—One and one-quarter inches diameter for the jackshaft  $1\frac{1}{8}$  for the rear axle is recommended.

12—See Fig. 3 for this.

13—Use annular bearings to carry a load

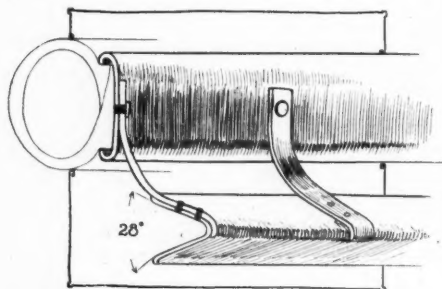


FIG. 6—METHOD OF FASTENING V-BELT RIMS TO WHEELS

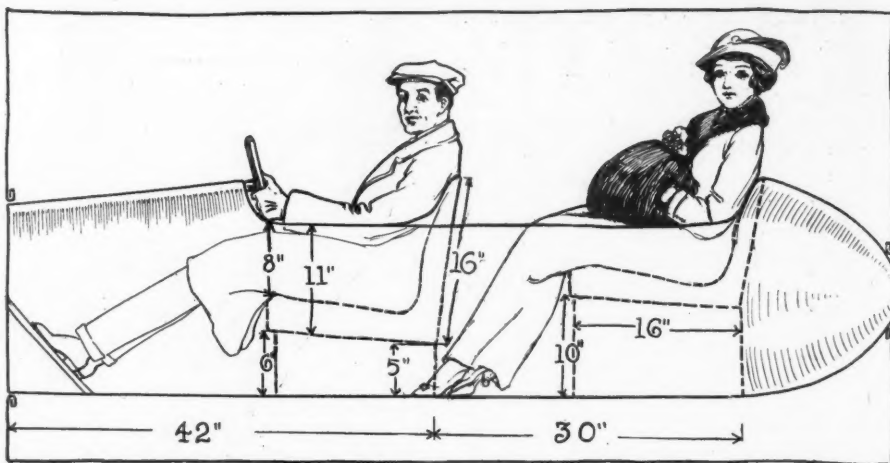


FIG. 2—SEATING DIMENSIONS FOR TANDEM-TYPE CAR AS SUGGESTED

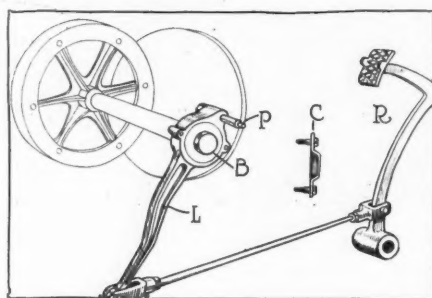


FIG. 3—HOW A JACKSHAFT BEARING CAN BE MOVED TO GIVE FRICTION ADJUSTMENT

of at least 300 pounds at 1,000 revolutions. The dimensions may be gotten from catalogs.

#### KNUCKLE FOR STEERING WHEEL Advice Sought, but Buying the Part Is Recommended

Rochester, Pa.—Editor Motor Age—How can one make a knuckle for the front wheel for steering? I want to use tubing to fasten it to the axle.

2—Advise me how to assemble a wire wheel, that is when one has the spokes, rim and hub, the latter being finished.

3—Give a description outlining how the pulleys are fastened to the rear wheels.—Subscriber.

1—You probably would save time by buying a steering knuckle already forged, brazing it to the axle which you can make of tubing. Forgings of this kind can be had from the DeCross Cy-car Co., Cincinnati, O., or the Warren Electric Machine

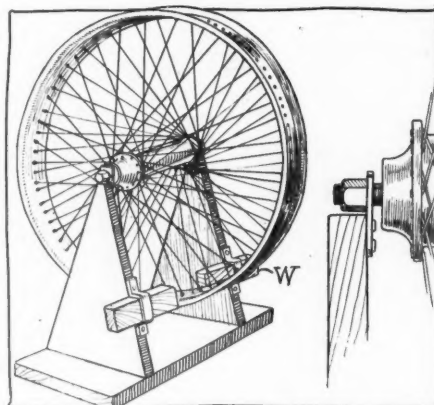


FIG. 5—FRAME FOR TRUING UP WIRE WHEELS

Co., Indianapolis, Ind. so you should have no trouble here.

If you make your own steering knuckle, have patterns made for castings of steel or bronze, as shown in Fig. 4. Here the steering yoke is shown at Y with tubing axle T brazed into the opening in the yoke. The knuckle is a separate casting shown at K having an arm A for steering pivoted about a pin P. The wheel spindle S is bolted on a taper through a lug on the side of the knuckle casting as shown. This will give you an idea of the general arrangement to be followed. The spindle should be at the rear of the knuckle K and the steering arm A may run backward or forward depending on your steering gear. A spring seat C is also shown brazed to the tube axle.

2—In making up the wheels, having procured the hub, spokes, and the rim drilled and countersunk, make up a fixture as shown in Fig. 5, or a similar figure that would hold the wheel on one side to which the spindle of the hub can be fastened securely. Lace up the spokes from the hub to the rim in such a manner that they cross each other three, or better, four times before reaching the rim. Fit all spokes loosely and then as you tighten them up test the wheel for trueness by means of the slides W on either side, which will also show you whether the wheel is central.

3—V-belt pulleys may be fastened to the wheel rim as shown in Fig. 6. This is the method used by the more prominent firms. Be sure the angle of the belt pulley is 28 degrees.

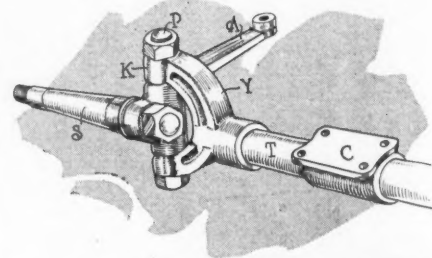


FIG. 4—STEERING ARRANGEMENT WITH WHEEL SPINDLE SEPARATE



# The Motor Car Repair Shop

## Method of Detecting Imperfections in Water Manifolds

### Testing Water Manifolds

MUCH may be learned by the repairman in following the practice at the various motor car factories in testing motor parts and if such practice is instituted in the shop much better work may result. The Willys-Overland Co. uses unusual precautions in testing the water manifolds which enter into the motor construction. These manifolds are made of cast aluminum and water is circulated in them from the radiator to the cylinder jackets.

In testing, these manifolds are fastened securely to a level surface upon which a rubber gasket has been placed. The ends then are connected by means of a hose, to a large water main as shown in Fig. 2. The water issues from the main at a pressure of 100 pounds per square inch. Cold water is used for it is stated by engineers that this is much better than either hot water or steam for revealing sand holes or any other imperfection in the casting. In the Overland test the cold water is permitted to rush into the manifold and then a careful examination will show whether the manifold is fit for use in the motor.

### Tightening Small Nuts

Should small nuts require tightening and no wrench be at hand which fits the nut, the method shown in Fig. 1, may be used. This consists in inserting the bit of a screwdriver in the space between the nut and the wrench, when the latter is in position.

### An Unusual Carburetor Ailment

Recently an owner entered the establishment of a large carburetor manufacturer and complained that the carburetor on his car was flooding continually, that the engine smoked and the plugs sooted rapidly. The owner could not understand the peculiar action and blamed it on the

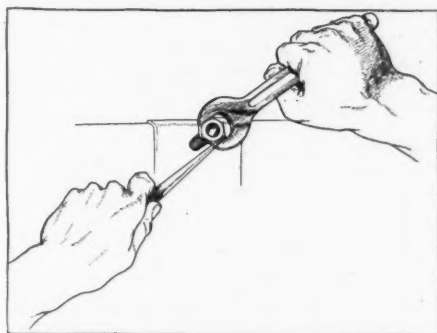


FIG. 1—TIGHTENING A SMALL NUT

The above method is used extensively when a small nut is to be tightened and none but a large wrench is available. The bit of a screwdriver is placed as shown

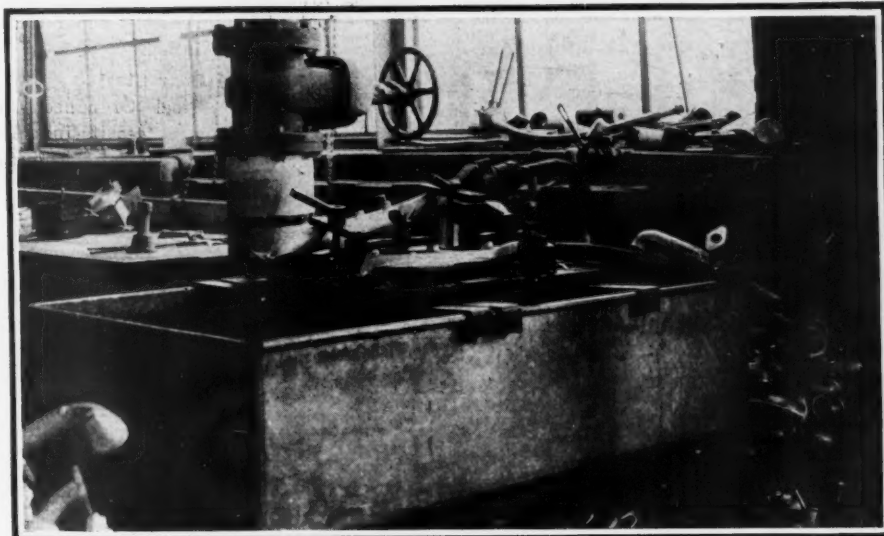


FIG. 2—METHOD OF TESTING OVERLAND WATER MANIFOLDS

Cold water at a pressure of 100 pounds is forced through the manifold, which is fastened to a level surface upon which a rubber gasket has been placed

carburetor. The car was examined and it was found that the tank pressure read zero almost, in fact, the repairman relieved all the pressure in the tank and still the carburetor seemed to flood. The float needle valve seated perfectly and there was nothing wrong seemingly with the instrument, yet flooding continued. However, a sample of the fuel was taken by the carburetor maker and he found that the owner was using a very heavy grade of what he thought was gasoline but which, in reality, more nearly approached kerosene mixed with gasoline.

This gave room for thought, and showed ultimately that the carburetor flooded because of the poor grade of fuel used. The action was simple. Motor suction drew the gasoline contents through the nozzle as a vapor and the heavier portion although passing the nozzle was mostly in liquid form. The heavier part of the fuel condensed on the inside of the intake manifold and carburetor and when the motor stopped and the suction ceased this condensed liquid ran out through the primary air intake, which made it appear that the carburetor was flooding. This condition will be more noticeable at this time of the year than during the summer months as the cold hastens condensation.

### Some Common Magneto Troubles

In some makes of magnetos the distributor cover is held in place by clamps of some sort, in other words a flexible contact is made as against a rigid fastening used on other makes. In such instruments the distributor cover may wobble a little after the magneto has been in use some

time with the result that the motor may misfire, and in one case reported recently the motor refused to operate. Should the reader have a car equipped with such a magneto he should examine the distributor cover occasionally to note if an undue amount of play is present. The cover may be held more firmly if the metal clamps are sprung a little or if a piece of thick paper or cloth is inserted between the clamp and the sides of the cover.

Loose wires always are a cause of much annoyance. The magneto wires which fit into the distributor become so loose sometimes that they jump out of place. In the Eisemann magneto used on the Packard 18 and 30 this condition was noted many times by the writer. In the instance mentioned, however, an adjustment was provided at the wire's end. Where no adjustment is provided a few turns of small diameter copper wire wound around the end of the lead usually hold the terminal secure. Another method and one used by drivers of racing cars is to place all the wires in a conduit and then fasten the conduit securely to some part of the motor, in three or four different places.

A want-to-do-my-own-repairing owner was assembling a few motor parts and when he came to the magneto found that the shim for the base was missing. He promptly cut one out of fiber and replaced the magneto only to find that the motor would not operate when assembled. This owner forgot to remember that a metal shim was used to line up the magneto because the ground connection is through the base of the instrument.

# The Accessory Corner

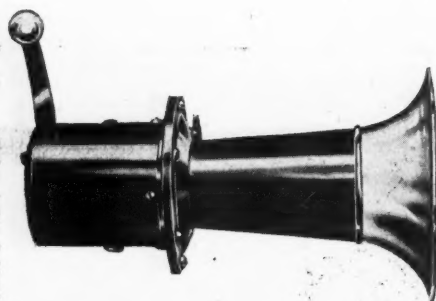


FIG. 1—SPARTON-ECHO HORN  
May be operated by hand, foot, elbow or knee according to its relative position

## Sparton-Echo Hand Horn

**SPARKS-WITHINGTON Co.**, Jackson, Mich., is offering another warning signal applicable to motor cars, the newcomer being one that may be operated by the hand, foot, elbow or knee, depending upon the position of the instrument. The Sparton-Echo is the name given the latest addition to the Sparton family, and the maker claims the tone is equal to that of electric horns. The feature of this new instrument, illustrated in Fig. 1 is the absence of gears and the ease of adjustment. A screwdriver is all that is necessary to bring the tone to the desired pitch and this is done without resorting to dis-assembly. All the wearing parts are said to be hardened, thus insuring long life and efficiency during life. The Sparton-Echo will be marketed in two styles, one selling at \$7 and called the model J and the other at \$8, tagged model B.

## Auto Stop Thief

Locking and unlocking the ignition, and shifter levers, etc., of a motor car by a combination as one would a safe, is the latest development in theft-preventing devices. The Auto Protection Co., Chicago, is the maker of this lock known as the Auto Stop Thief. As shown in Fig. 4 the only visible part of the device is a series of ten buttons. These buttons protrude through a metal plate fastened to the dash of the car. Each instrument sold has a different combination. Should, for example, the combination be D-H-O-T only when the buttons are pressed in the order named will the car be unlocked.

By pressing any button but the last of the combination the car is locked and only when the combination is worked will the car be ready for use. The Auto Stop Thief may be made to control the ignition system in any way desired, that is, either low or high-tension wires may be tapped, the gearset may be locked or the shifter levers held secure. Another advantage of this device is that an owner to prevent joy-riding may lock his ignition. The only way one may start the

car is by breaking the dash and examining the system to determine how it has been locked. The Auto Stop Thief is being sold for \$20 installed.

## New Chrome-Nickel Gear Steel

The Washington Steel Ordnance Co., Washington, D. C., announces its invasion of the motor field with the production of

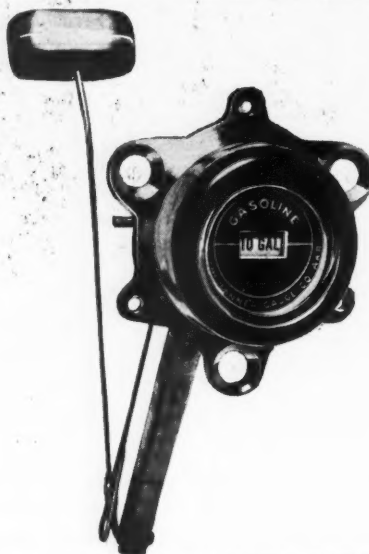


FIG. 2—TANNER GASOLINE GAUGE  
Designed especially for cowl fuel tanks and shows the tank capacity at a window

special chrome-nickel gear steel, containing a high percentage of nickel and hardening in air. A number of advantages are claimed for this steel, among which are homogeneity and absence of segregation, high tensile strength and great resistance to abrasion and compression. In tests performed by the maker the steel showed a tensile strength of 282,500 pounds per square inch, an elastic limit of 159,000, a 10 per cent elongation in 2 inches and a reduction of area of 23.5 per cent.

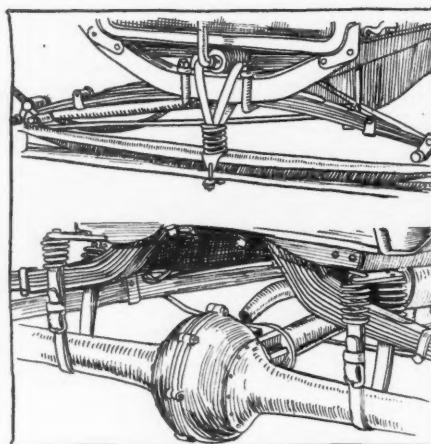


FIG. 3—BUCKEYE SHOCK ABSORBERS  
A simple type for making Ford cars ride easier. No holes are drilled for their installation



FIG. 4—AUTO STOP THIEF  
Secures a motor car by a combination as a safe secures money

The new steel is known as the G-35 special air-hardening steel and the gear treatment consists in heating to 1,600 degrees F. and then allowing the gear to cool in air. It is claimed no hardening strains are introduced into the metal and consequently no warping. Tested with a scleroscope, a hardness of 75 is obtained on the ordinary design of transmission gear. Another feature of this steel is that the gear may be finish-machined before treatment. This steel is made by the basic open hearth process and is shipped as drop forgings, thus all responsibility is taken by the maker.

## Buckeye Shock Absorbers for Fords

The Central Brass and Fixture Co., Springfield, O., is marketing the Buckeye shock absorbers for Ford cars, which appear in the form of auxiliary springs and are said to make riding in this type of car more pleasant. The absorbers come in sets of three, one for the front and two for the rear, as shown in Fig. 3, and selling for \$5 a set. The front absorber, besides preventing rebound, also prevents excessive compression, it is claimed. No holes are required to be drilled for installing the Buckeye absorbers, for they are clamped to the frame as shown in the illustration, the leather strap going underneath the axle housing. The shipping weight of the three is 7 pounds.

## Soss Invisible Hinges

The Soss Mfg. Co., Brooklyn, N. Y., has brought out a new type of invisible body hinge for motor cars, the feature of which is that it requires the removal of but two screws for detachment. By a clever arrangement water is prevented from reaching the wood of the body pillar through the hinge.

## Tanner Gasoline Gauge

The Tanner-Hower Mfg. Co., Akron, O., has brought out a new type of gasoline gauge which tells at a glance the quantity of fuel in the tank. This gauge was designed especially for use with cowl tanks.

It is of the float type as may be seen from the illustration in Fig. 2 and the float



which is pivoted in the shank of the gauge. In its movement, actuates a brass level. The amount of fuel is read in the window either as, full, 10 gallons, 5 gallons or empty.

#### Manzel Tire Pump

A motor-driven two-cylinder, air-cooled tire pump is the latest product of Manzel Bros. Co., Buffalo, N. Y. The cylinders are cast in block and a barrel crankcase is used with the crankshaft removable through a plate at one end. The cylinder dimensions are 1.63 by 1.75 inches, which enables the pump to inflate a 36 by 4.5 inch tire to 90 pounds pressure in 1.33 minutes. The crankshaft is a drop forging mounted on bronze bearings. The connecting-rods are also of this material and so the wrist and crankpin bearings are made by merely machining the two ends of the rod to size. Lubrication is by splash with an oil reservoir in the crankcase, to which lubricant is added occasionally.

Air is drawn into the cylinder through ports on each side of it, which are uncovered by the piston at the bottom of its stroke. Ball discharge valves automatically open when a point on the compression stroke is reached where the pressure in the cylinder equals the pressure in the line plus the pressure required to open the valve. There is a safety valve in the exhaust passageway to prevent the pressure from rising high enough to burst the tires. The equipment includes 15 feet of rubber hose and a nickel-plated gauge. With dog clutch or gear drive, this pump sells for \$28. The pump is shown in Fig. 8.

#### Allen Wire Wheel Case

Most of the wire wheels in use at present are designed so that the whole wheel is changed when a tire repair is made. The ordinary type of tire cover is unsuited for the spare tires carried because the spokes interfere with the cover's attachment. This led the Allen Auto Specialty Co., New York, to design the tire cover



FIG. 5—ANGIER FORD WHEEL  
Showing method of removing the wheel by unscrewing six nuts

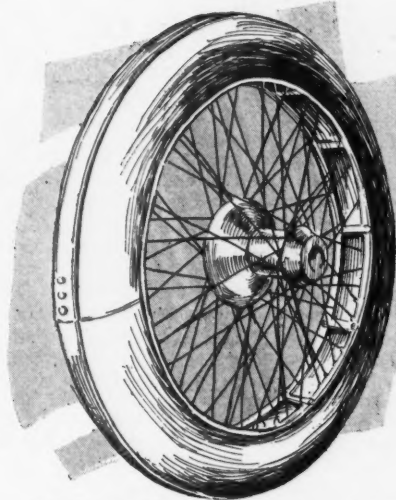


FIG. 6—ALLEN WIRE WHEEL CASE  
The inner edge of the case consists of two heavy fabric rings held by small straps

shown in Fig. 6, in which the inner edges of the casing consist of two heavy fabric rings. These rings are held by small straps which force them against the rim of the wheel, thus making a tight joint.

#### Angier Spare Demountable Ford Wheel

A tire change in 2 minutes is said to be no uncommon feat with the use of Angier's spare demountable Ford wheel shown in Figs. 5 and 9, brought out recently by F. L. Angier, Streator, Ill. The use of the Ford demountable enables one to carry a spare wheel with tire attached so that in the event of a blowout or puncture, the entire wheel may be changed.

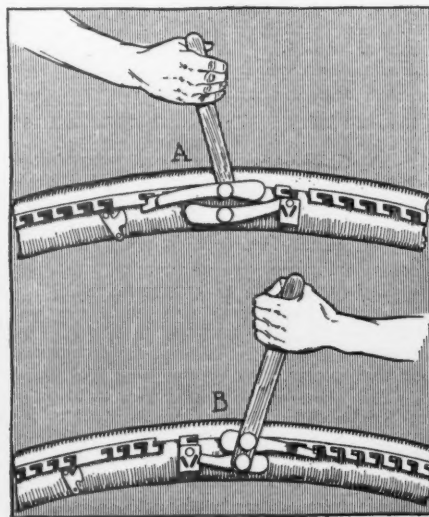


FIG. 7—CONTINENTAL RIM TOOL  
The upper illustration shows the method of using the tool for rim removal

The spare wheel is interchangeable with any of the ordinary Ford wheels. The use of the spare requires the installation of studs which replace the present hub bolts, new wheel flanges and a few minor attachments. The operation of preparing the car for this demountable feature is said to

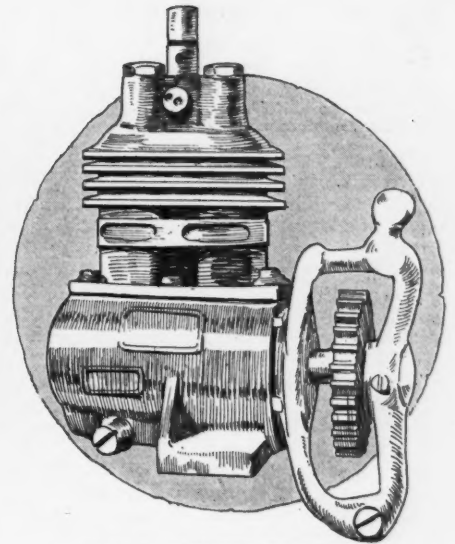


FIG. 8—MANZEL TIRE PUMP  
This two-cylinder pump may be driven by dog clutch or gears and is said to inflate quickly

be the work of one man for 3 hours. With the wheels installed under the Angier system, the unscrewing of six nuts as shown in the illustration, frees the wheel. The entire outfit ready for installation sells for \$20.

#### Continental Rim Tool

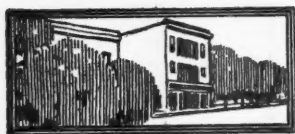
A handy tool for detaching Continental demountable rims is shown in Fig. 7. The illustration at A indicates the method of taking the rim apart: the tool is inserted as shown and the handle is pushed over until the rim is loose. For putting the rim together the tool is turned around, when a pull on the handle tightens the rim. This device is made by the Standard Welding Co., Cleveland, O.

#### Correction

The Russ carbon remover described in the November 13 issue is sold at \$18 without expansion chamber and not without reducing valve as stated.



FIG. 9—THE ANGIER DEMOUNTED  
The wheel removed after the six nuts have been unscrewed



# Among the Makers and Dealers



**AMPLEX Sale December 9**—The Amplex Motor Car Co.'s plant at Mishawaka, Ind., will be sold for cash at public sale on December 9.

**Michigan Buggy Sale December 13**—The bankrupt Michigan Buggy Co. of Kalamazoo, Mich., will be sold at public auction at Kalamazoo December 13, the sale starting at 10:30 a. m.

**Jefferson After Motor Car Plant**—The citizens of Jefferson, O., have organized a permanent industrial committee for the purpose of attracting industries to the city. Among the first to be sought is a motor car factory.

**Pyrene Use Cuts Risk Rates**—The Aetna Accident and Liability Co. and the Automobile Insurance Co. of Hartford, Conn., recently announced a reduction of fire insurance rates on all pleasure cars and motor trucks equipped with Pyrene fire extinguishers of 1-quart capacity or over.

**Pathfinder Capital Stock Increased**—The Motor Car Mfg. Co., Indianapolis, manufacturer of the Pathfinder, has recently increased its capital stock \$100,000 for the purpose of better handling the company's increasing business. Notice of the increase has been filed with the Indiana secretary of state.

**Veteran Knox Employee Resigns**—A. L. Longtin, who for the past 11 years has been in the employ of the Knox Automobile Co., Springfield, Mass., in various capacities from time-keeper to assistant superintendent, foundry superintendent and lately as manager of production and costs, has resigned.

**Making Cyclecar Accessories**—A new industry, the manufacture of tops and windshields for cyclecars, has been established at Manitowoc, Wis., by Joseph Steiner, inventor of a simple top and glass front for the new type of vehicle. Mr. Steiner has conducted a trimming shop at Manitowoc for 15 years.

**Albert F. O'Neil Dies**—Albert F. O'Neil, brother to George F. O'Neil, president and general manager of the O'Neil Oil and Paint Co., Milwaukee, Wis., one of the largest independent distributors of lubricants and fuel in the northwest, died suddenly in Canada while on a pleasure trip. Mr. O'Neil was a director and heavy stockholder in the Milwaukee concern. He was a native of Milwaukee and 49 years of age.

**Planhard Mfg. Co. Is Bankrupt**—A voluntary petition in bankruptcy has been filed in the United States Court at Indianapolis, by the Planhard Mfg. Co. of Kokomo, Ind., and the court has named Charles H. Felske as receiver. The company and a majority of the creditors asked for the appointment of Felske, who has been superintendent of the plant for some time. The bankruptcy petition filed shows liabilities of \$36,197.20 and assets of \$3,680.02.

**Checking Up on Shipping Facilities**—With the approach of the heavy shipping season, J. S. Marvin, general traffic manager of the Automobile Chamber of Commerce, Inc., has been making an investigation of the car situation to ascertain the railroad conditions and whether factory shipments are likely to be promptly handled by the railroads. Records show that motor car equipment of eastern railroads at the present time is scattered all over the country and Mr. Marvin has sent a special letter to the proper officers of every railroad, number-

ing nearly a thousand, calling attention to these conditions and requesting that the cars be sent to the home roads and the factory districts.

**Rowe Truck Makers Move**—Owing to its increased business, the Rowe Motor Truck Co. of Coatesville, Pa., has purchased new buildings at Downingtown, Pa., where all business will be conducted.

**Hood Issues Preferred Stock**—The Hood Rubber Co. is offering preferred shareholders the right to subscribe to half of the newly authorized \$1,000,000 preferred stock at par, in ratio of one new for three old shares. Subscriptions expire December 20, by which date payment in full must be made.

**Takes Out Patent License**—The Emil Grossman Mfg. Co. has taken out a license to manufacture Red Head priming plugs under patents 642,167 and 915,896 and announces that all such plugs manufactured and shipped prior to November 22 are protected under these patents.

**Decides Patent Is Invalid**—In the suit brought by Charles Fischer against the Automobile Supply Co., Inc., for an alleged infringement on a flexible tube patent, the United States circuit court of appeals has decided that the patent is invalid and refused to allow \$6,000 damages.

**More Stock for Lambert Makers**—An increase in capital stock of \$100,000 has been made by the Buckeye Mfg. Co., Anderson, Ind., which manufactures the Lambert. The company's business has been increasing and the additional capital will enable the company to handle its increased business in a satisfactory manner.

**Hamilton Gets Crown Factory**—The Crown Motor Car Co., which manufactures the Crown 30 and which has been located at Louisville, Ky., is arranging to remove its plant to Hamilton, O. F. B. Lambert is president of the company. The car was first developed in the plant of the Buckeye Mfg. Co. at Anderson, Ind.

**Test Motor Tractor Plow**—An exhaustive test was recently given the first tractor plow manufactured by the Breece Motor Plow Co. of Wapakoneta, O., which was entirely successful in every particular. The Breece Motor Plow Co. was recently incorporated and organized and will at once make a number of tractors to be put in the market.

**New Canadian Motor Center**—The prospect of developing at Coldbrook, N. B., an important industrial suburb within 3 miles of St. John, grows steadily brighter. The Maritime Motor Car Co. has a factory there for the manufacture of the Maritime Singer, and it is announced that a new factory will be completed in the spring. The Ford Motor Co. also will establish at Coldbrook an assembling plant and service station, which means a great extension to the business.

**More Power for Kissel Plant**—The annual inventory and renovations of the main plant of the Kissel Motor Car Co., at Hartford, Wis., will take place during December and that period will be the first during 1913 that this factory has ceased manufacture. The midsummer shut-down, common to most plants, was eliminated by the Kissel this year, owing to the early demand for new cars. During 6 of the 9 months now passed, the employees of the Hartford factory have worked overtime. Among the improvements to be introduced in the Hartford factory is a new power-generating plant, which will increase

the present generative capacity from 1,000 to 1,500 horse. The new equipment consists of a steam turbine with two 250-horsepower generators.

**To Handle Flyer Sales Direct**—The Flyer Motor Car Co. announces that it has severed all connections with the Thomas Howard Co. of Brooklyn and hereafter will handle all sales direct from the main office at Detroit or the factory at Mt. Clemens, Mich.

**Motz Employees Are Promoted**—W. E. Cameron, previously western sales manager for the Motz Tire and Rubber Co., has recently been appointed assistant sales manager. R. O. Brinker, previously branch manager at Washington, D. C., is now manager of the commercial tire department.

**Blackhawk Receiver Appointed**—Ardo Mitchell, president of the Blackhawk Motor Co., of Moline, Ill., has been appointed receiver for the company by Judge R. W. Olmstead. The company was organized July 24, 1911, with a capital stock of \$25,000, which was later increased to \$150,000, although only \$89,300 has been paid in. The company is now declared insolvent with liabilities of \$50,000.

**Leaves Stearns to Build Cyclecar**—Robert Clarke, chief inspector of the F. B. Stearns Co., has resigned to enter the cyclecar field. He has designed a cyclecar which he expects to manufacture and place on the market in the near future. Mr. Clark was superintendent in the machine shop of the Daimler Motor Car Co. and the Humber Motor Car Co. of England, and also superintendent of the Columbia Motor Car Co.'s factory at Hartford, Conn.

**Tanner Gauge Co. Reorganized**—The Tanner Gauge Co. of Akron, O., which was formed several years ago for the manufacture of gasoline gauges, by Perry E. Tanner, has recently incorporated as the Tanner-Hower Mfg. Co., with M. Otis Hower, president; P. E. Tanner, vice-president and general manager; W. T. Helfer, secretary, and A. W. Tanner, treasurer. The company will now branch out into the manufacture and sale of articles other than gasoline gauges. New machinery is now being added.

**Moline Adopts Classic Trade Mark**—Sir Galahad, the most perfect of King Arthur's Knights of the Round Table, has been chosen by the Moline Automobile Co. as the central figure of the new name plate which will take the place of the familiar dreadnought emblem on the Moline-Knight. The new name plate comprises a harmonizing combination of gold and royal blue colorings—the color scheme of King Arthur's knights. The famous painting of Sir Galahad is depicted in the center upon a shield shaped medallion in gold. On one side of Sir Galahad is the name "Moline" and on the other "Knight," printed in white and backed up with blue enamel.

**May Liquidate Milwaukee Motor Claims**—Both meetings of creditors to declare a first dividend on claims and to consider a proposition to take up the remaining indebtedness of the Milwaukee Motor Co., held November 28, were postponed by Referee E. Q. Nye. Creditors will meet December 8 to consider the offer of John C. Coerper and Ernst G. Miller, heavy stockholders in the defunct company, to advance \$70,000 to liquidate all claims and stop suit of the company against Ernst G. and Elise K. Miller. The plant and equipment recently were sold to the Harris interests, as the Chicago House Wreck-



ing Co., Chicago, for \$86,000, and the accounts receivable are now being put into shape for sale to the highest bidder at receiver's sale some time during December.

**Russell Joins Bessemer Truck Forces**—R. F. Russell, formerly assistant chief engineer of the Alco plant, has taken charge of the engineering department of the Bessemer Motor Truck Co., Grove City, Pa.

**Grant Buys Findlay Motor Co.**—The Findlay Motor Co. of Findlay, O., which was thrown into the hands of a receiver nearly 2 years ago, was sold last week to the Grant Motor Co. of Detroit, which will open the plant immediately on orders for 5,000 two-passenger roadsters to be called the Grant.

**Ford Enlarging Canadian Plant**—Officials of the Ford Motor Car Co. at Ford, Ont., have recently announced another addition to the plant that already stands as the largest motor car plant under the British flag. This time the addition will take the form of the doubling of the capacity of the heat treatment building.

**Jesco Opens French Branch**—The adoption of the Jesco electric lighting and starting system by several makers of French cars has resulted in the establishment of the Societe Jesco at 35 Rue de Villejust, Paris, as a foreign branch of the Jones Electric Starter Co. of Chicago, manufacturer of the Jesco system.

**Making New Ford Coupe Body**—Another new coupe body for two-passenger Ford cars has been designed and placed on the market by the Commercial Auto Body and Mfg. Co. of Cleveland, O. The body fits the chassis of the car and the seat is completely enclosed in a roomy hood with glass front and sides.

**Goets Elected Stephenson Trustee**—Julius J. Goets of Milwaukee was elected trustee of the bankrupt estate of the Stephenson Motor Truck Co., South Milwaukee, Wis., at the first meeting of creditors. The creditors will meet December 9 to take up the general business relating to the bankrupt estate.

**Heavy Increase in Franklin Sales**—The sale of Franklin cars for the 10 months of 1913, ending October 31, show an increase of 76 per cent over the same period in 1912, is the report coming from the sales department of the Franklin Automobile Co. Sales for September and October were double the corresponding months of 1912.

**English Company Makes Ricker Buyer**—Chester S. Ricker of Indianapolis, Ind., consulting engineer and designer of the Henderson, has been appointed American representative and buyer for the United Motor Industries, Ltd., of London, England. This firm is headed by S. F. Edge, former sales manager of the Napier Co.

**No Bidder for Ohio Falls Plant**—The plant of the Ohio Falls Motor Co., New Albany, Ind., which was offered for sale by Joseph Bruns, receiver, on November 26, failed to attract a bidder. According to a decree of the court, the plant must sell at \$40,000, the purchaser to pay \$15,000 and assume liens aggregating \$25,000. The result of the sale will be reported to Judge Utz in the circuit court, where it will be determined whether a reappraisal of the property shall be made.

**Colby Testing Compensating Device**—Professor S. C. Shipley of the engineering department of the University of Minnesota and C. G. Minor and A. M. Walsh of the Colby Sales Co. will leave soon for a trip to Boston in a Colby car equipped with a compensating device which the Standard Investment Co. has invested in to the extent of buying the rights. The device will take the place of gear differential on the axles. The gear work is done by ec-

centrics, which direct the power to the wheel that has the most resistance. Under normal conditions the power will go to both wheels. Ninety per cent of skidding will be eliminated if the device comes up to the expectations of the inventors.

**Will Not Buy G. M. C. Plant**—The Fall City Rubber Co. of Cuyahoga Falls, O., which was negotiating for the purchase of the vacant factory building of the General Motors Co. at Clyde, O., has decided not to locate there. At a meeting of the directors of the company it was decided that the factory is too large for their use.

**Kearns Employees Made Stockholders**—The Kearns Motor Truck Co., Beaverton, Pa., has been incorporated under the laws of Delaware for \$100,000, \$40,000 of which is 6 per cent cumulative preferred and \$60,000 common stock. The par value of the shares is \$10. The incorporation is on the co-operative basis, employees having taken stock. The owners of the business

## Recent Incorporations

**Albany, N. Y.**—Roland Gas Electric Vehicle Co., capital stock \$200,000; general motor car business; incorporators, P. K. Hexter, R. R. Conklin, S. L. Conklin.

**Auburn, N. Y.**—McIntosh & Seymour Corp., capital stock \$2,200,000; to manufacture diesel engines; incorporators, E. S. Church, F. B. Kirkbridge, P. W. Henry.

**Brooklyn, N. Y.**—DeLuxe Garage Co., capital stock \$5,000; incorporators, F. Staeudel and K. Staeudel.

**Canistota, N. Y.**—The Automobile Machine Co., capital stock \$3,000; to manufacture springs and other parts for motor cars; incorporators, C. B. Schaumburg, J. L. Schaumburg, W. F. McGreevy, C. L. Thomas.

**Chicago**—Silent Elyer Motor Co., capital stock \$15,000, to deal in motorcycles and accessories; incorporators, W. M. Melling, A. H. Doorfler, F. Doorfler.

**Cleveland, O.**—Foster-Birdsall Motor Car Co., capital stock \$10,000; to deal in motor cars; incorporators, C. R. Foster, F. W. Frey, J. G. Well, W. H. Birdsall and E. J. Burdick.

**Cleveland, O.**—Knight Motor Repair & Garage Co., capital stock \$5,000; to do repair work; incorporators, A. House, F. R. Kyle, F. X. Schaut, C. L. Allen and W. H. Buckins.

**Columbus, O.**—The Taylor Motor Cut-Out Block Co., to manufacture devices for the purpose of locating trouble in motors.

**Crawfordsville, Ind.**—The American Motor Vehicle Co., capital stock \$600,000; to manufacture motor trucks and motors; incorporators, W. H. Owen, C. S. Rowland, and J. V. Wilson.

**Detroit, Mich.**—Transportation Engineering Co., capital stock \$1,200; to manufacture motor equipment; incorporators, R. J. Macklin and R. F. Beach.

**Eau Claire, Wis.**—The Northwestern Motor Co., capital stock \$25,000; to manufacture gasoline motors for motor cars and tractors; incorporators, K. Roshold, T. W. Roshold and R. P. Roshold.

**Franklin, Pa.**—Standard Appliance Co., capital stock \$250,000; to manufacture engine and motor starters; incorporators, Q. D. Hastings, D. Domlitz, F. I. Shettler.

**Indianapolis, Ind.**—Central Prest-O-Ceal Co., capital stock \$50,000; to manufacture Prest-O-Ceal, a tire compound; incorporators, F. K. Gardner, H. L. Archey, G. C. Grimes.

**Lansing, Mich.**—Detroit Barton Auto Top Co., capital stock \$10,000; to manufacture motor car accessories; incorporators, A. Barton, G. S. Field, I. M. Willis.

**Lima, O.**—The Lima Motor Transit Co., capital stock \$10,000; to operate a motor bus line; incorporators, W. S. Pierce, F. W. Cook, W. B. Berryman, H. W. Pears and R. B. Davis.

**Louisville, Ky.**—The Louisville Automobile Light Controlling Co., capital stock \$10,000; incorporators, J. C. Stone, J. G. Harris, B. D. Lake, N. O. Marks.

**Louisville, Ky.**—Auto Tire Brokerage Co., to deal in motor car tires; incorporators, A. L. McCormick, W. J. Welch, C. L. Holden.

**Lowell, Mass.**—Howard Street Garage, capital stock \$2,000; incorporators, D. Ziskind, M. Cohen, H. Jolly.

**Manhattan, N. Y.**—United Auto Rim Co., capital stock \$50,000; incorporators, C. W. Schildwachter, W. Linden, P. S. Smith.

**Marion, O.**—Ohio Tractor Sales Co., capital stock \$50,000; to manufacture and buy and sell machinery; incorporators, W. W. Williams, H. A. Stevens, N. M. Miller, W. H. Schaeffer, C. Lee.

**Milford, Mass.**—Baker Motor Sales Co., capital stock \$5,000; incorporators, W. D. Leahy, W. H. Baker, E. P. Dillon.

**Nashville, Tenn.**—Roberts Gas & Gasoline Engine & Car Co., capital stock \$50,000; to manufacture engines.

have taken \$40,000 of the common stock, to reimburse them in part for the experimentation, good-will, etc. The balance of \$20,000 common is to be divided among the preferred stockholders, at the rate of one share of common gratis with every two shares of preferred.

**German Steel Branch in Indianapolis**—Representatives of the Bismarck Steel Works, Berlin, Germany, have been in Indianapolis recently, investigating the feasibility of establishing a distributing station in that city. It is understood that their investigation was satisfactory. Karl Schneider, a director of the company, and Frank Wallace of New York, an American representative, visited Indianapolis. Until recently the tariff on the company's products has been so high as to preclude exporting it to the United States on a large scale. It is reported as likely that a station for the distribution of the company's products, particularly nickel, will be established in Indianapolis within a month.

**New York**—The Broadway Auto Sales Co., capital stock \$2,000; incorporators, B. F. Thomas, R. G. Randolph and L. E. Jeter.

**New York**—The G. Piel Co., capital stock \$100,000; incorporators, G. Piel, C. S. Pinkney, H. J. Robinson.

**New York**—G. Piel Co., capital stock \$100,000; incorporators, G. Piel, C. S. Pinkney, H. J. Robinson.

**New York**—The Goodyear Co., capital stock \$10,000, to deal in rubber and dry goods; incorporators, E. J. Zwilling, N. J. Jacobs, J. A. O'Rourke.

**New York**—Golde Patent Manufacturing Co., capital stock \$200,000; to deal in motor supplies and accessories; incorporators, H. L. Geller, B. C. McKenna, N. M. Kaplan.

**New York**—H. M. Kinsman Co., capital stock \$25,000; to deal in carriages, motor cars, horses, accessories; incorporators, H. M. Kinsman, H. L. Farmer, E. E. Wright.

**New York**—Merchants' Motor Sales Co., capital stock \$120,000; general motor car business; incorporators, B. Cukor, H. V. Radonitz, C. J. Quinn.

**New York**—Patent Rubber Co., capital stock \$50,000; to manufacture tires and rubber goods; incorporators, W. N. Croxton, J. G. Metz, C. L. Brookheim.

**New York**—Paige-Detroit Co., capital stock \$50,000; to manufacture motors, machinery, etc.; incorporators, E. M. Dalley, S. J. Wise, F. W. Kolb.

**New York**—United Auto Rim Co., capital stock \$50,000; to manufacture rims; incorporators, C. W. Schildechter, A. Linden, P. S. Smith.

**Newcastle, O.**—The Goodwin-Gallivan Motor Co., capital stock \$10,000; to deal in retail motor cars, incorporators, W. M. and J. C. Goodwin, J. P. Gallivan.

**Norwood, N. Y.**—H. M. Kinsman Co., capital stock \$25,000; incorporators, H. M. Kinsman, H. L. Farmer, E. E. Wright.

**Philadelphia, Pa.**—F. H. Scott Co., capital stock \$100,000; to deal and manufacture motors, dynamos, switch cabinets, etc.; incorporators, F. H. Scott, C. B. Lorimer, L. N. Mills.

**Pittsburgh, Pa.**—Vulcan Motor Truck and Service Co., capital stock \$25,000; incorporators, D. O. Jones, G. S. Hartley and T. F. Kennelly.

**Rochester, N. Y.**—H. L. F. Trebert Rotary Motor Co., capital stock \$150,000; incorporators, H. L. F. Trebert, N. J. Shrag and L. Gerome.

**San Antonio, Tex.**—San Antonio Automobile Race Club, capital stock \$8,000; incorporators, W. A. Herring, Emil Frank, H. G. Staacke, Dr. Frederick Fielding, John B. Carrington.

**San Francisco, Calif.**—Kleiber & Co., capital stock \$250,000; to manufacture motor trucks.

**St. Louis, Mo.**—Three Kays Co., capital stock \$2,000; to manufacture carbon cleaning compounds for gasoline engines and motors.

**St. Louis, Mo.**—Motor Storage Co., capital stock \$250,000; to do storage business in the downtown district; incorporators, H. B. Graham, H. S. Gotshall and W. J. Holbrook.

**St. Louis, Mo.**—Vaught Inspection and Service Bureau, to inspect motor cars; incorporators, C. C. Vaughn, E. J. Dykstra, and W. F. Horsting.

**Syracuse, N. Y.**—Sagamore Motors Corp., capital stock \$75,000; incorporators, J. S. Brown, C. G. Hanna and E. W. Lawton.

**Tacoma, Wash.**—Tacoma Transit Co., capital stock \$30,000; to conduct motor car service.

**Tiffin, O.**—The H. J. Cochrel Service Co., capital stock \$10,000; general motor car business and deal in motorcycles and accessories; incorporators, H. J. Cochrel, E. K. McMorris, J. D. McMorris, H. L. Cleveland and J. D. Watson.

**Versailles, Mo.**—Morgan County Road Builders' Association, capital stock \$6,000; to build roads in Morgan county and buy and sell road building machinery.

**Washington, Mo.**—Missouri Southern Route Association, capital stock \$25,000; incorporator, J. H. Dickbrader.

**Wilmington, Del.**—Maxwell Motor Sales Corporation, capital stock \$10,000; representative, James J. Buttery.

**Wilmington, Del.**—Moore Motor Truck Co., capital stock \$300,000; incorporators, C. B. Bishop, C. J. Jacobs, H. W. Davis.



# Brief Business Announcements



## Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS					
Town	Agent	Make	Town	Agent	Make
Aguadilla, P. R.	Sanders, Phillippi & Co.	Cole	Marshall, Texas	L. S. Hawley	Oakland
Albany, N. Y.	W. L. Schupp & Sons	Oakland	Mart, Texas	J. L. Vaughn	Oakland
Alma, Mich.	J. W. Wright	Maxwell	Mason, Texas	Lagle Auto Co.	Oakland
Alvinston, Que.	G. A. Haddeb	Overland	Mathis, Texas	C. C. Braden	Moon
Ames, Iowa	George Bader	Ohio	Menno, S. Dak.	G. A. Halsch	Oakland
Antigo, Wis.	Reed & Duval	Cole	Middleport, O.	Forrest & Williamson	Oakland
Ashland, Ore.	Morris & Lidstrom	Oakland	Millersburg, O.	Frank Piers	Oakland
Atlantic City, N. J.	Samuel T. Zelle	Oakland	Minneapolis, Minn.	Ballard Automobile Co.	Maxwell
Aurora, Ill.	T. S. Simpson	Cole	Minneapolis, Minn.	Portland Auto Company	Pullman
Austin, Texas	Abadie Garage Co.	Moon	Montreal, Que.	Leger & St. Pierre	Partin Palmer
Bartlesville, Ok.	Cherokee Motor Co.	Moon	Montreal, Que.	Leger & St. Pierre	Oakland
Bellevue, Mich.	C. H. Legge	Maxwell	Montreal, Que.	Auto & Garage Co., Ltd.	Maxwell
Binghamton, N. Y.	Binghamton Motor Car Co.	Oakland	Montreal, Que.	Gadbois, Ltd.	Palmer-Singer
Brocton, N. Y.	Lawrence Ryckman	Oakland	Montreal, Que.	Badvois, Ltd.	Case
Canton, Pa.	Harry Bruce	Oakland	Morestown, N. J.	Harry Pew	Oakland
Capac, Mich.	H. C. Siegel	Maxwell	Mt. Auburn, Ill.	H. S. Armstrong	Cole
Charlotte, Mich.	Donovan & McCormick	Maxwell	Mt. Union, Pa.	H. N. Bell	Oakland
Chesapeake City, Md.	Ralph H. Rees	Oakland	North Wales, Pa.	Robt. M. Hallowell	Oakland
Cleburne, Texas	Corson Auto Co.	Oakland	Norwich, N. Y.	T. A. Jewell	Oakland
Cobleskill, N. Y.	W. Harold Fox	Pullman	Olcott, N. Y.	W. F. Kruger	Oakland
Coleman, Texas	W. A. Gray	Oakland	Omaha, Neb.	Oppen-Van Fleet Auto Co.	Kissel
Colorado, Texas	W. J. Phoenix	Oakland	Omaha, Neb.	Oppen-Van Fleet Auto Co.	Krit
Colton, Wash.	J. Maynard	Maxwell	Omaha, Neb.	Drummond Motor Co.	Cole
Columbus, O.	Daniel Motor Co.	Little	Parkersburg, W. Va.	The Cole Motor Co.	Cole
Coriscana, Texas	Warren & Urban	Oakland	Paxinos, Pa.	N. C. Adams	Oakland
Corvallis, Ore.	Myers Auto Co.	Oakland	Phoenix, Ariz.	A. G. Woodill	Oakland
Decatur, Ill.	W. L. Shellabarger & Sons	Oakland	Phoenix, Ariz.	W. D. Tremaine	Maxwell
Delaware, O.	Griffith & Cone	Regal	Phoenix, Ariz.	A. W. Newton	Paige-Detroit
Denison, Texas	Pearce Auto Co.	Oakland	Piqua, O.	C. R. Alexander	Regal
Dublin, Ga.	Burts Garage	Velle	Prosper, Texas	A. P. Mahard	Oakland
Elgin, Ill.	Elgin Motor Co.	Cole	Punxsutawney, Pa.	The McQuown Auto Co.	Cole
Elmira, N. Y.	Elmira Ford Co.	Oakland	Saco, Me.	R. D. Milliken	Oakland
Eugene, Ore.	Pacific Auto Co.	Oakland	Salem, N. J.	Geo. S. Smith	Oakland
Garden City, Texas	E. T. Cobb	Oakland	Salem, Ore.	Reis & Elgin	Oakland
Grove City, O.	Ed. Emelhaize	Regal	Schenectady, N. Y.	H. W. Chubb	Oakland
Geleste, Texas	Whittemore & Hutton	Oakland	Seattle, Wash.	Parker Bros. Motor Car Co.	Pullman
Gooding, Idaho	Walter Gooding	Cole	Seattle, Wash.	Seattle Automobile Co.	Stearns-Knight
Goldendale, Wash.	R. D. Sunderland	Cole	Seattle, Wash.	Parker Motor Car Co.	Pullman
Grant's Pass, Ore.	J. H. Williams	Oakland	Sharon, Pa.	Chas. H. Wiltzie	Franklin
Green Camp, O.	R. C. McClelland	Regal	Sonora, Texas	W. L. Aldwell	Oakland
Greensburg, Ind.	Oakland Sales Co.	Oakland	Springfield, Mass.	Hempen Auto Co.	Pullman
Greenville, Texas	S. R. McWhirter	Oakland	Steele, Idaho	M. J. Steele	Overland
Helena, Ark.	B. L. Lyford	Cole	Stephenville, Texas	John Gage	Oakland
Henderson, Texas	Lacey Hightower	Oakland	St. Marys, Pa.	W. G. Wismeth	Cole
Henry, Ill.	J. E. Berry	Moon	Taylor, Texas	Pruitt Auto Co.	Moon
Hillsboro, Texas	Newton & Porter	Oakland	Teague, Texas	L. R. Boyd	Oakland
Hillsdale, Ind.	Edward Jackson	Oakland	Tempe, Ariz.	S. Z. Earle	Studebaker
Honey Grove, Texas	W. L. Dial	Oakland	Tiffin, O.	Harding & Harding	Bulck
Holyoke, Mass.	Dunbar Motor Co.	Oakland	Toledo, Ohio	Bacon Bros., care McCreery Mfg. Co.	Pullman
Indianapolis, Ind.	H. Archey	Havnes	Toledo, O.	Cornelius Hohly Auto Co.	Krit
Island City, Ore.	J. J. Quinland	Oakland	Topeka, Kas.	George R. Evans	Cole
Johnson, Wash.	J. Maynard	Maxwell	Trent, Texas	R. H. Reeves	Oakland
Kane, Pa.	Kane Supply Co.	Cole	Vancouver, B. C.	Vancouver Ohio Electric Car Co.	Ohio
Kemp, Texas	H. W. Haynie	Oakland	Waco, Texas	Clem Bagwell	Oakland
Kingston, N. Y.	James Millard & Sons Co.	Oakland	Washington, D. C.	Cole Motor Sales Co.	Cole
Lampasas, Texas	Lampasas Auto Co.	Oakland	Washington, D. C.	Marion Sales & Service Co.	Marion
Lena, Ill.	T. Dan Van Matre	Franklin	Weatherford, Texas	Mark Putnam	Oakland
Lexington, Ky.	Thos. Dewhurst	Oakland	Wichita Falls, Texas	Schnell & Weaver	Oakland
London, O.	O. A. Hicks	Regal	Wilmington, Del.	F. W. Ayers	Oakland
Los Angeles, Calif.	L. E. Crowe and E. L. Simonds	Marion	Wilmington, O.	W. H. Hoskins	Regal
Los Angeles, Calif.	L. E. Crowe and E. L. Simonds	Marathon	Winchester, Ky.	Asa Hughes	Oakland
Manchester, N. H.	H. L. Lamprey	Pullman	Wooster, O.	E. C. Bennett & Co.	Oakland

## COMMERCIAL CARS

Akron, O.	Main Street Garage	Stewart
Columbus, O.	F. E. Avery & Son	Stewart
Fall River, Mass.	H. A. Horton	Koehler
New Bedford, Mass.	Samuel Benoit	Koehler
Omaha, Neb.	A. Murphy & Son	Stewart
Portland, Ore.	H. L. Kents Auto Co.	Stewart

St. Louis, Mo.	Rauch and Lang	Van Auken
Syracuse, N. Y.	Stowell Motor Car Co.	Stewart
Willimantic, Conn.	Jordan Auto Co.	Koehler
York, Me.	R. C. Blaisdell	Koehler
Youngstown, O.	Lawrence Hoffmaster	Vulcan

**WASHINGTON, D. C.**—H. E. Jencks has been appointed manager of the Locomobile branch.

**Marietta, O.**—C. Wilderman has been appointed sub-agent for the Firestone tires in Marietta and Parkersburg.

**Washington, D. C.**—The Automobile Tire Co. of New York has opened a branch at Fourteenth and L streets, N. W.

**Kankakee, Ill.**—Gray & Swanell has purchased the motor car business of Fleming & Brown, and will continue the Reo agency here. Mr. Fleming retired to look after his farming interests. The new firm takes possession December 1.

**Cleveland, O.**—The Bulck Garage, East One Hundred and Fifth street, near Wade Park avenue, has been leased by the Knight Motor Repair and Garage Co. Arthur House is president of the Knight company; Frank B. Kyle, vice-president; Frank X. Schaut, secretary-treasurer, and C. L. Allen, general

manager. The fifth incorporator is Walter Buckins. All the men in the concern were formerly employed at the Stearns-Knight plant.

**Columbus, O.**—The Columbus Welding Shop is the name of a new repair concern located at 294 North Third street, Columbus.

**Sheboygan, Wis.**—The E. & H. Motor Co., of Sheboygan, Wis., agent for the Mitchell and Regal, has awarded contracts for a garage of its own, to be located at North Ninth street and Ontario avenue, and have dimensions of 50x150 feet. It will be ready about February 15.

**Kalamazoo, Mich.**—February 3 to 7, inclusive, is the date decided upon for Kalamazoo's fifth annual motor car show. The exhibit will be made in the new \$50,000 state armory recently completed. A few weeks ago the dealers of the city formed an association known as the Kalamazoo Auto Dealers' Association, to take charge of all matters pertaining to the local exhibit. In the past all

shows have been conducted under the auspices of some fraternal order which gave the dealers practically no financial returns.

**Canonsburg, Pa.**—Harry H. Brown, Hupmobile agent, was killed November 14 while hunting, when his shotgun was accidentally discharged.

**New York**—George H. Smith, formerly in charge of Peerless truck sales in New Jersey, has been appointed general manager of the Peerless Motor Car Co. of New York. H. T. Birnie has been appointed assistant manager of the branch.

**Milwaukee, Wis.**—Milwaukee's first cyclecar selling agency has just been organized by Alex C. Templeton, until now sales manager of the Milwaukee branch of the Kisselkar, and George W. Kliegel and Ray J. Everhardt. The concern has taken the agency for the Imp cyclecar, manufactured at Auburn, Ind., and plans an active campaign throughout the state of Wisconsin. Mr. Kliegel is secretary and treasurer of the



Davis Manufacturing Co., Milwaukee, motors, and Mr. Everhardt is an expert mechanic. The new company is capitalized at \$5,000.

**Oxford, O.**—Walter Hoffman and Harry London have formed a partnership to engage in the repair business.

**Boston, Mass.**—D. C. Briggs, for some years identified with the Boston branch of the Oakland, has joined the sales force of the Boston Buick Co.

**San Marcos, Tex.**—A garage has been opened here by W. E. Anderson and Joe Green under the name of the Auto Sales and Supply Co.

**Schleislingerville, Wis.**—Geller and Winberg have opened up a new garage on the Fond du Lac road and have taken the local agency for the Ford.

**Fremont, O.**—L. A. McVey has sold the Jackson garage on Birchard avenue to Fred Fuller, formerly manager of the Palace garage.

**Indianapolis, Ind.**—Harry L. Archey, well known on the local row, has taken the Haynes agency for Indianapolis with salesrooms at 225 North Meridian street.

**Philadelphia, Pa.**—Lit Bros., a local department store at Eighth and Market streets, has been appointed local distributor of the Empire tire, a product of Trenton, N. J.

**Ripon, Wis.**—A. M. Harger has leased the Bishop building at Ripon, Wis., and is remodeling it into a garage and salesroom and repair shop. Occupancy will be taken about February 1, 1914.

**Columbus, O.**—The real and personal property of the Barndt and Johnston Auto Supply Co. will be offered at public auction on November 29 by F. W. Herbst, receiver of that company.

**Boston, Mass.**—L. H. Bradbury, for many years with the J. W. Maguire Co., handling the Pierce-Arrow line, has resigned to accept a position with the Boston agency for the Simplex car.

**Niles, O.**—The Niles Auto and Machine Co. has leased the building formerly occupied by the Sykes Lath and Roofing Co. The company will for the present confine itself to motor car repairing.

**Boston, Mass.**—Frederick D. Markee is the latest addition to the sales force of the Pope Hartford Co., of Boston, where he will act as salesman for the Maxwell line just taken on by the company.

**Boston, Mass.**—The Westcott car is now being handled in Boston by John W. Harding, who has the New England territory, making his headquarters for the present at 233 Massachusetts avenue.

**Buffalo, N. Y.**—The Hurd-Landsheft Motor Co., 1440-1442 Main street, has secured the agency in this territory for the Abbott-Detroit. This firm was recently organized by Melville J. Hurd and Raymond Landsheft, both of Buffalo.

**Bloomington, Ill.**—The Overland agency, controlling the territory of central Illinois, which has been held for several years by J. L. Murray & Co., has been transferred to the firm of C. U. Williams & Son. The annual output in this territory is 500 cars.

**Philadelphia, Pa.**—The local offices of the Chandler Motor Car Co., wholesale distributor of the Chandler six for the southeastern states, have been consolidated with the Whiting Motor Car Co., the retail agency, and removed to the latter's headquarters, 5 North Twenty-first street.

**Peoria, Ill.**—The Trivoli Automobile and Machine Co., of Trivoli, Ill., has been sold to Moody Bros., operating a garage and sales agency at Trivoli, Ill., and a wholesale and retail motor car tire and supply business at 1805 Main street, Peoria, Ill. The partnership consists of J. Herman Moody of Trivoli, Ill., who will manage the

Trivoli branch, and Hartley H. Moody of Peoria, Ill., who will manage the Peoria branch.

**Dayton, O.**—The Tourists' Tire and Rubber Co. will handle the local agency for the Miller Rubber Co.

**Boston, Mass.**—H. B. Pruden has resigned as manager of the Kissel New England branch, effective upon the appointment of a successor on December 31.

**Columbus, O.**—The Youngman Electric Garage Co. is the name of a new concern at 20 East Spring street, Columbus, O., operated by B. M. and W. R. Youngman.

**Lakewood, O.**—W. F. Gholson, owner of the Lakewood garage, 11913 Detroit avenue, has leased the plant to H. R. Forsyth, who in turn leased the electric car department to N. Kornmiller.

**Buffalo, N. Y.**—Cuthbert A. Wood of London, England, has accepted the offer of Mason B. Hatch to act in Buffalo as local sales manager of the Hatch Automobile Co. Prior to coming here, Mr. Wood has acted as agent in Paris and Berlin for the American Express Co.

**Dayton, O.**—Directors of the Stoddard-Dayton-Maxwell Repair Co., at a reorganization meeting, accepted the resignation of Charles Shellman, and elected R. E. Gerspacher, district manager for the Michelin Tire Co., as secretary and treasurer. Mr. Gerspacher will take up his new duties January 1.

**Milwaukee, Wis.**—The garage and salesrooms of the Hickman-Lauson-Diener Co., 135-143 Eighth street, Milwaukee, Wis., were destroyed by fire of unknown origin at midnight on November 30, causing a loss estimated at \$120,000. The concern is state distributor for the Ford and 38 cars were badly damaged. The Hickman company has

located in temporary quarters and the original agency building will be placed in shape without delay.

**Boston, Mass.**—J. S. Keown has just been advanced to the position of assistant manager of the Boston Ford branch to take the place vacated by Forest H. Peabody, who was transferred to Louisville, Ky.

**Pittsburgh, Pa.**—George B. Chapman, formerly with the Goodyear Tire and Rubber Co., has been made general manager of the Vulcan Motor Truck and Service Co., financed by Pittsburgh capital.

**Atlanta, Ga.**—T. L. Odom, travelling salesman for the Ford Motor Co. out of Atlanta, has gone to Chattanooga, Tenn., to handle the retail sales for D. S. Erherage, the Ford dealer in that territory.

**Spokane, Wash.**—Philip Day, formerly manager of the Portland branch of the Metropolitan Motor Car Co., has taken charge of the Spokane branch of that company, succeeding B. F. Wood.

**Niles, O.**—The Niles Auto and Machine Co., a new firm, has opened up a garage and machine shop and may eventually branch out into motor car construction. H. A. Wilson and R. G. Adams are owners.

**Cleveland, O.**—Alpha M. Brown has launched the Alpha M. Brown Sales Co. at 2001 Euclid avenue, where the Blackledge shock absorber will be handled along with other specialties. Mr. Brown has lately been associated with the Hiland Auto Co., of Pittsburgh.

**New York**—The Motor Car Equipment Co., New York, has been appointed sole distributor of Weed chains for the Metropolitan district, which comprises the following territory: New York city, all of Long Island and Brooklyn, Westchester county, Jersey City and Newark.

**San Francisco, Cal.**—Announcement has been made on San Francisco's row that the Reliance Automobile Co. and the Auto Sales Co. will consolidate. The Reliance Auto Co. has taken over the Auto Sales Co., which carries with it the agency for the Velle cars.

**Oshkosh, Wis.**—A large garage and salesroom will be established at Oshkosh, Wis., by the newly organized Winnebago County Auto Co., capital \$18,000. George E. Steiner, F. C. and M. Behlendorf are the principal stockholders. Agency lines have not yet been decided upon.

**San Francisco, Cal.**—The Federal Rubber Mfg. Co. of Milwaukee has closed a contract for a new Pacific coast branch building on the southwest corner of Van Ness avenue and Sutter street, San Francisco, the building to be completed February 1. This branch will be the distributing point for Federal tires on the Pacific coast, Hawaii, etc.

**Milwaukee, Wis.**—Al Rentner and David Smith, expert mechanics who have been associated with various branches and service stations in Milwaukee for many years, have organized as the Rentner-Smith Co. and leased a large floor space in the new Cudahy building, Jackson and Mason streets, for garage and repair shop purposes. The concern will specialize in the care and repair of electric starters.

**Buffalo, N. Y.**—The Goodrich and Diamond tire branches in Buffalo have been consolidated, the Diamond branch at 715 Main street being closed and the business of the two branches being concentrated in the Goodrich branch at 731 Main street, under the management of H. B. Niblette, who also takes over the management of the branches in Rochester and Syracuse. J. F. Lanier, former manager here of the Diamond branch, has been promoted to a factory position.

## Coming Motor Events

### SHOWS, CONVENTIONS, ETC.

December 6-13—Show, Toledo, O.  
 December 9-12—Annual convention of American Road Builders' Association, Philadelphia.  
 December 11-20—First International Exposition of Safety and Sanitation, New York city, American Museum of Safety.  
 January 2-10—Importers' Automobile Salon, Hotel Astor, New York.  
 January 3-10—New York show, Grand Central palace.  
 January 4-8—S. A. E. meeting, New York.  
 January 10-16—Milwaukee, Wis., show.  
 January 10-17—Philadelphia show.  
 January 10-17—Show, Cleveland, O.  
 January 10-21—Show, Brussels, Belgium.  
 January 12-17—Show, Bridgeport, Conn.  
 January 17-24—Show, Detroit, Mich.  
 January 24-February 7—Show, Montreal Can.  
 January 24-31—Rochester, N. Y., show.  
 January 24-31—Chicago show.  
 January 26-31—Scranton, Pa.  
 January 31-February 7—Minneapolis show.  
 February 2-7—Buffalo passenger car show.  
 February 3-7—Show, Kalamazoo, Mich.  
 February 4-7—Show, St. Joseph, Mo.  
 January 5-10—Show at Los Angeles, Cal.  
 February 9-14—Buffalo truck show.  
 February 9-14—Show, Grand Rapids, Mich.  
 February 16-21—Kansas City show.  
 February 18-21—Bloomington, Ill., show.  
 February 21-28—Newark, N. J.  
 February 22—March 5—Cincinnati, O.  
 February 23-28—Omaha show.  
 March 2-4—Cincinnati Commercial Car Show.  
 March 2-6—Show, Ft. Dodge, Ia.  
 March 7-14—Boston passenger car show.  
 March 9-14—Show at Des Moines, Ia.  
 March 17-21—Boston truck show.  
 February 21-28—Cincinnati Passenger Car Show.

### CONTESTS

May 30, 1914—Indianapolis 500-mile race.



# From the Four Winds



**TOLEDO Club Doubles Membership**—The membership of the Toledo Automobile Club has been increased to 400 as a result of a whirlwind campaign that has just ended. The campaign netted about 200 members.

**Lincoln Road 3,388.6 Miles Long**—According to figures just completed by Frank H. Trego, chief engineer, the Lincoln highway is 3,388.6 miles long from New York to San Francisco. The half-way mark is between Lexington and Covad, Neb.

**Ardent Motorist at Age of 92**—At Wabash, Ont., there lives an enthusiastic motorist 92 years old. She is Mrs. Eliza Smith, who came to Canada from Scotland 65 years ago. Mrs. Smith is a legal and enthusiastic Ford owner, making many summer tours, on which she is driven by her daughter.

**Poor Constables in 24 Counties**—The report of motor car fines turned into the state treasury during the fiscal year ending October 1 last makes the amazing disclosure that twenty-four counties out of sixty-one in New York failed to turn over a single dollar. It also shows that twenty-two counties have failed to report a single fine for motor car violations since the Callan law became effective in 1910.

**Millionaire to Boss Road Work**—For a millionaire to give up his own business for a whole year, deny himself many comforts that pertain to one in his station in life, don rubber boots, overalls and a jumper and give his time—without a cent of pay—to the occupation of supervising the county roads is rather a long step toward altruistic ideals. Nevertheless, that is what John B. Yeon, Oregon lumber king, real estate holder, capitalist, motorist and good roads enthusiast, has agreed to do for the people of Multnomah county.

**Horse Auctioneer Sells Motor Cars**—The Fiss, Doerr & Carroll Horse Co., a leading horse dealer of New York, has established as an adjunct to its business a weekly sale of motor cars and commercial vehicles. The machine consigned to this company will be sold at auction at 3 o'clock Thursday of each week, and the highest bidder will secure the cars. There will be a charge of 5 per cent on all cars selling over \$100 and \$5 a car on sales less than \$100. A special sales ring has been constructed to carry on this line of work and every facility installed.

**Milwaukee May Have Bus Line**—S. E. Lyon, of New York, promoter of motor bus lines and other enterprises, is in Milwaukee to interest local capital and business interests in the establishment of a motor bus line. Mr. Lyon is working with aldermen on the proposition of franchises for using certain streets for the regular operation of motor buses connecting suburbs on the east and west sides and the intervening territory with the business district. The plan is similar to that now in operation on Fifth avenue, New York. It is intended to maintain a 2-minute schedule.

**Boom Ocean-to-Gulf Highway**—The proposed Borderland route between Los Angeles and Galveston has been received with much enthusiasm by the people of the region between San Antonio and El Paso. Steps are being taken by the various towns along the route, including Marfa, Alpine, Valentine, Sierra Blanca, Ozona, Del Rio and Uvalde to form associations to promote the construction of the road in their respective districts. The section between San Antonio and Galveston lacks but little of being completed. The route as originally planned by the Borderland

Route Association organized at Phoenix, Ariz., was to extend between Los Angeles and El Paso. Upon the request of the El Paso delegates, it was decided to make it an ocean-to-the-gulf route.

**Motor Fire Tractors Economical**—Motor tractors for the fire department are less expensive to maintain than fire horses, according to the decision of Mayor R. L. Cofran of Topeka, Kan. The mayor has gone over the situation carefully, and has found that the cost of feeding and caring for horses when they are not at work brings the cost of upkeep higher than that required for tractors, including supplies and repairs. As a result several new tractors will be purchased for the department during the coming year, and it is the plan to continue installing motor equipment until the last horse in the department has been displaced.

**Will Widen National Pike**—The Old National Pike is to be improved within the next year through the efforts of those residing along its thoroughfare. It is proposed to form a voluntary organization of people living along its route and appoint a captain in each township. This organization will see about planting trees of an equal distance apart along the entire route and have buildings moved back, so that there will be 80 feet right of way. These volunteers will cooperate with the state highway department. When the work is completed in the fall of 1914, it will be made a state event. President Wilson will be asked to come to Ohio, and motor cars will convey parties over the entire distance.

**Rural Motor Shows Planned**—Rural motor shows, an innovation in Wisconsin, is a plan to be tried in several farming communities in the southern part of Wisconsin this year. Motorists of Elkhorn, Walworth county, have organized and leased a large hall in Elkhorn, in which a motor show designed along big city lines will be held from January 4 to 10. This is the week before the Milwaukee show, most important in the state, is held. Local agents throughout Walworth county have purchased exhibition space and already it is certain that fifty of the leading makes will be on display. Elkhorn is a city of about 3,250 inhabitants. Local merchants are enthusiastic over the plan, because it is believed that by giving Walworth county people a chance to see at home the same things they can see at the big show at Milwaukee, they will benefit by the trade that follows such visits.

**To Improve New Service Route**—A good roads meeting of nation-wide importance to motor tourists was held in Denver recently, and the Gulf-National Parks Highway Association was organized by 150 delegates from Colorado, Wyoming, Montana, South Dakota, Nebraska and Texas. The officers of the new organization are: President, Fred G. Walsen, a director of the Denver Motor Club; first vice-president, H. C. Benham, Sheridan, Wyo.; second and third vice-presidents, Charles J. Crockett, Greeley, Colo., and W. S. Gurnsey, Billings, Mont.; secretary and treasurer, Ralph P. Benedict, Denver. The establishing and improving of an official route from the Gulf of Mexico to the Yellowstone and Glacier National Parks is counted upon to give a substantial stimulus to motor touring northward in the summer and southward in the winter. The scenic advantages afforded by the new highway, especially in and near the mountains, are also expected to attract many tourists from intersecting east

and west routes. Colorado has spent \$150,000 this year toward the improvement of its share of the route decided upon.

**Good Customers of John D.**—The growth of the motor car and motor boat in Canada is shown by the fact that gasoline valued at \$5,846,364 was imported during the last fiscal year as compared with \$1,961,015 the year before.

**Carries Yeggs' Soup in Motor Car**—The American Glycerine Co., which operates in central Indiana, is using ten motor cars for the transportation of nitroglycerine. The rear seat of each machine is removed and a specially built box is provided in which the explosive may be carried with some degree of safety.

**Jolt for Taxicab Trust**—A decision upholding the constitutionality of the New York public hack ordinance was rendered recently. The privilege of monopolizing cab stands at the principal hotels of the city was taken away from the taxicab trust, which it is claimed paid half a million dollars a year for it. The new ordinance prohibits private hack stands at hotels and lowers the rate of 80 cents to 50 cents for the first mile. The taxicab owners and the hotel proprietors will carry the matter to the court of appeals.

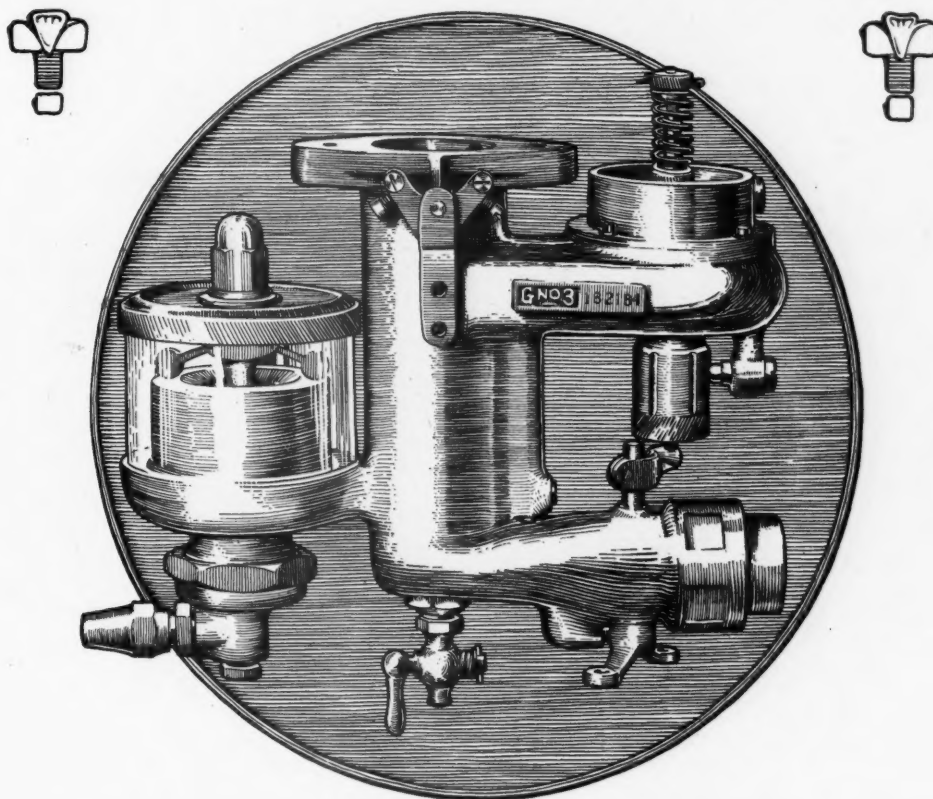
**License Fees May Total \$400,000**—State Registrar Shearer of the Ohio motor department is contemplating a net balance of more than \$400,000 at the end of the year. This amount practically is assured if the present receipts are maintained throughout the remainder of the year. The total net receipts to September 22 are \$388,871.72 and the total number of licenses issued was 84,300. The total net receipts to September 22 are greater by more than \$100,000 for the entire 12 months last year. The total number of licenses issued last year was 63,000. The excess receipts go to road funds.

**Electrics Popular in Cleveland**—More than one-third of the electric motor cars in the state of Ohio are owned by residents of Cleveland, according to State Registrar Shearer, who has just completed a part of his annual report. In Cleveland there are 1,880 electrics, while the total number in the state is 4,115. In Franklin county there are 526 electric cars, Hamilton county 343, Lucas county 399, Mahoning county 146, and Summit county 134. In 22 counties of the state there are no electric vehicles. In 1912 there were only 3,610 electric cars in the state. The receipts for license tags for these cars in 1913 amount to \$12,345.

**River an Object of Collision**—A decision of interests to motorists who carry liability insurance covering collision and property damage has been handed down by Judge Ryan of the municipal court at Appleton, Wis. Fred Felix Wettengill of Appleton brought suit against the United States Lloyds for \$776.19 and costs to recover on a liability policy on his car, which was badly damaged by running into an open draw over Fox river at Green Bay on October 11, 1912. When Mr. Wettengill made claim for damages, the insurance company refused payment, claiming that the river cannot be considered an object of collision. The court holds that a river is an object by which damages can be sustained by another moving object. It is likely that the case will be appealed to the higher courts, as the point is a most important one. Many similar accidents occur in Wisconsin each year, but never before has the point of collecting damages been raised in the courts.



*Does Your Car Carry Just  
a Carburetor, or Is It a—*



# STROMBERG

## CARBURETOR

*"The Accepted Standard"*

Stromberg Motor Devices Company

54 E. 25th Street, Chicago, Ill.

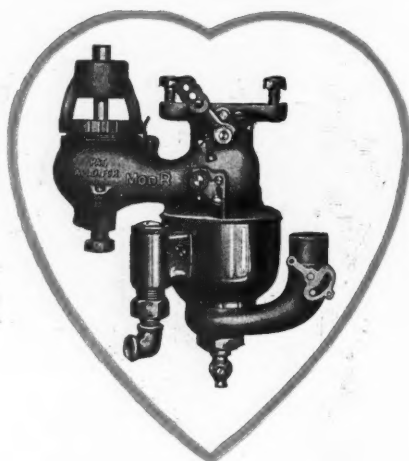
Branches: NEW YORK, BOSTON, DETROIT, INDIANAPOLIS, MINNEAPOLIS

Pacific Coast Distributors: Chaslor & Lyon Company, Los Angeles, Portland, Fresno, Spokane, San Francisco, Seattle

Canadian Distributors: Russell Motor Car Company, Toronto, Montreal, Hamilton, Winnipeg, Calgary, Vancouver

# Schebler

Model  
R



1914

## Carburetor

Correct in principle  
Simple of adjustment  
Automatic in action

Sure starting  
Greater power and speed  
Better economy

**WHEELER & SCHEBLER, Indianapolis, Ind.**

*"Pioneers in Perfection of Carburetion"*

**BRANCHES:**

FRY & MCGILL MOTOR SUPPLY CO.....	Denver, Colo.	WHEELER & SCHEBLER.....	Chicago
AUTOMOBILE ACCESSORIES CO.....	Pittsburgh, Pa.	WHEELER & SCHEBLER.....	Detroit
FERRIS-DUNLAP AUTO SUPPLY CO.....	Dallas, Tex.	FRED CAMPBELL.....	St. Louis, Mo.
INTERSTATE ELECTRIC CO.....	New Orleans, La.	W. J. CONNELL.....	Boston, Mass.
REINHARD BROS. CO.....	Minneapolis, Minn.	EQUIPMENT CO.....	Kansas City, Mo.
MANUFACTURERS' SUPPLY CO.....	Philadelphia, Pa.	ELYEA-AUSTELL CO.....	Atlanta, Ga.
WEINSTOCK-NICHOLS CO.....	Los Angeles, Cal.	J. C. NICHOLS.....	New York City
PENNSYLVANIA RUBBER & SUPPLY CO.....	Cleveland	WEINSTOCK-NICHOLS.....	San Francisco

FAIRBANKS, MORSE & CO., Ltd., London, England  
CANADIAN FAIRBANKS-MORSE CO. (All principal Canadian Cities)



**Car Buyer:** I see you advertise an "electric horn" in your equipment. Is it a Klaxon?

**Car Agent:** Well—no. But it's just about the same.

**Car Buyer:** In that case I suppose you would just as soon give me a Klaxon in place of it.

**Car Agent:** Hardly that. You see this signal comes with the car. If you want

a Klaxon you have to buy it separately.

**Car Buyer:** What kind of a horn is the one on the car?

**Car Agent:** It's an "electric" horn—I don't know its name.

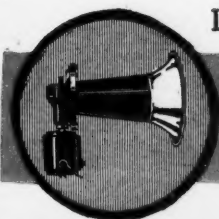
**Car Buyer:** That doesn't speak very well for your car maker. If he puts on an unknown, and evidently cheap signal, it's a pretty good indication that he will skimp somewhere else in the car. I guess I'll look further.

**64** car makers—including the makers of practically every high-grade car in America—believe it is a short-sighted policy to lay themselves open to this kind of criticism. They equip with the Klaxon

A. E. C.  
Alco  
Armleder  
H. H. Babcock  
Benz  
Borland Electric  
Broc Electric  
Buffalo Electric  
Roadster  
Century Electric  
Charon (*European*)  
Chicago Electric  
Clark  
Columbia  
Croxtan

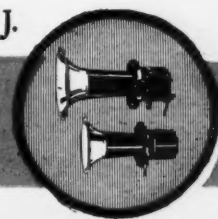
Davis	Oldsmobile
F. I. A. T.	Oxford
Havers "Six"	Packard
Jeffery	Peerless
King	Peugeot
KisselKar "Six"	Pierce-Arrow
Knickerbocker	Pope-Hartford "Six"
Knox	Pratt
Lancia ( <i>European</i> )	Sayers & Scovill
Lenox	S. & M. "Six"
Locomobile	Schneider ( <i>European</i> )
Lozier	S. G. V.
Luverne	Simplex
Marmon	Stafford
Matheson	Staver
Maxwell "Six"	Stearns
Mercedes	Sternberg
Metallurgique	Stevens-Duryea
Mors ( <i>European</i> )	Stoddard-Dayton
Multiplex	Touraine
National	Triumph
Nyberg	Walker Electric
Oakland	Ward
Ohio "Six"	White
Old Reliable	Winton

Lovell-McConnell Mfg. Company, Newark, N. J.



# KLAXON

*"The Public Safety Signal"*





*The longer a Borland Electric Worm Bevel is used the greater its efficiency becomes.*



*The Borland Electric Worm Bevel Gear requires practically no adjustment. Lubricating system perfect.*

## Now comes this new and exclusively Borland Electric Worm Bevel Gear

*easily the most important improvement  
ever made in any electric automobile*

**A** REAR axle of absolute silence. A more powerful motor drive from the same amount of power. A longer life for the car itself. Immensely increased comfort for the passengers. These are results obtained only by this new and exclusively Borland Electric Worm Bevel drive. Not a worm drive; or a bevel drive—but a Borland Electric Worm Bevel Drive. Only a comparative test can show you its astonishing superiority over any other kind of drive.

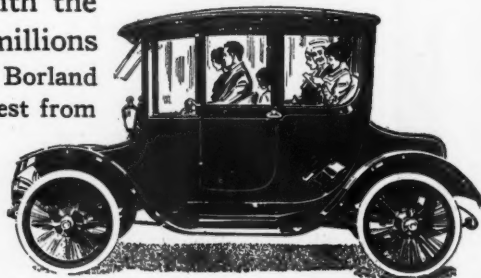
*5-passenger coupe  
with either front or  
rear seat drive.*

*The Borland  
Electric*

*The car with the  
clean-cut, thorough-  
bred air.*

**DEALERS:** *the demand for cars will jump—  
cash in on the assured profits!*

Buyers will hurry to see the Borland Electric with the new worm bevel drive. National advertising to millions of prospects will create an enormous demand. Is there a Borland Electric dealer in your territory? Who will reap the harvest from this new, fruitful field of dollars? Will YOU? Or, will some enterprising rival? Remember, this new and exclusively Borland Electric worm bevel gear will re-make electric automobile history. Pass up this chance—and you will miss the opportunity of a lifetime! Don't delay—write or wire us now—this very minute. Your territory may still be open. Get full particulars NOW!



**The Borland-Grannis Company**  
310 East Huron Street, Chicago, Illinois





# STORAGE BATTERIES

## Insure the Efficiency of Starting and Lighting Systems

The best electric equipment made would be worth but a few cents a pound without a dependable storage battery.

And, today, the car not equipped with electric starting and lighting is a back number.

To insure the utmost efficiency for their car owners, the **CLBA** Storage Battery is furnished by the following manufacturers:

**A**  
Abbott Motor Co., Detroit, Mich.  
Adams-Lancia Co., New York City.  
Allen Motor Car Co., Fostoria, O.  
Alpena Motor Car Co., Alpena, Mich.  
American La France Fire Eng. Co., Elmira, N. Y.  
American Motors Co., Indianapolis, Ind.  
Ames Motor Car Co., Owensboro, Ky.  
Apperson Bros. Automobile Co., Kokomo, Ind.  
O. Armleder Co., Cincinnati, Ohio.  
Auburn Automobile Co., Auburn, Ind.  
Austin Automobile Co., Grand Rapids, Mich.  
The Avery Co., Peoria, Ill.

**B**  
Bartholomew Co., Peoria, Ill.  
Benton Motor Car Co., Benton, Ill.  
L. Berg Carriage Co., Dallas City, Ill.  
Briggs-Detrolter Co., Detroit, Mich.  
Buckeye Mfg. Co., Anderson, Ind.

**C**  
Canadian Standard Auto & Tract. Co., Ft. Wayne, Ind.  
Cartercar Co., Pontiac, Mich.  
J. I. Case T. M. Co. Motor Works, Racine Jct., Wis.  
Chadwick Engineering Works, Pottstown, Pa.  
Chandler Motor Car Co., Cleveland, O.  
Chevrolet Motor Co., Flint, Mich.  
Colby Motor Co., Mason City, Ia.  
F. Coleman Carriage & Harness Co., Ilion, N.Y.  
Commerce Motor Truck Co., Detroit, Mich.  
Corblitt Automobile Co., Henderson, N. C.  
Crane Motor Car Co., Bayonne, N. J.  
Crawford Automobile Co., Hagerstown, Md.  
Crescent Motor Co., Cincinnati, Ohio.  
Crow Motor Car Co., Elkhart, Ind.  
Jas. Cunningham Son & Co., Rochester, N. Y.

**D**  
Geo. W. Davis Carriage Co., Richmond, Ind.  
De Dion Bouton, New York City.  
Dorris Motor Car Co., St. Louis, Mo.

**E**  
Elkhart Carriage & Harness Co., Elkhart, Ind.  
Enger Motor Car Co., Cincinnati, Ohio.

**F**  
F. A. L. Motor Car Co., Chicago, Ill.  
F. I. A. T. Company, Poughkeepsie, N. Y.  
Flanders Motor Co., Detroit, Mich.  
H. H. Franklin Mfg. Co., Syracuse, N. Y.

**G**  
Gramm-Bernstein Co., Lima, Ohio.  
Gramm Motor Truck Co., Lima, Ohio.  
Gramm Motor Truck Co., Walkerville, Ont.

**H**  
Havers Motor Car Co., Port Huron, Mich.  
Haynes Automobile Co., Kokomo, Ind.  
Henderson Motor Car Co., Indianapolis, Ind.  
Herreshoff Motor Co., Detroit, Mich.  
Howard Motor Car Co., Connersville, Ind.  
Hupp Motor Car Co., Detroit, Mich.

**I**  
Imperial Automobile Co., Jackson, Mich.

**J**  
Jackson Motor Car Co., Jackson, Mich.

**K**  
Kelly-Springfield Motor Truck Co., Springfield, Ohio.  
King Motor Car Co., Detroit, Mich.  
Kissel Motor Car Co., Hartford, Wis.  
Kline Motor Car Co., Richmond, Va.  
Knox Automobile Co., Springfield, Mass.  
Krit Motor Car Co., Detroit, Mich.

**L**  
Lancia Company, Turin, Italy.  
Lenox Motor Car Co., Boston, Mass.  
Lexington Motor Car Co., Connersville, Ind.  
Locomobile Company of America, Bridgeport, Conn.  
Lozier Motor Car Co., Detroit, Mich.  
Lyons Atlas Co., Indianapolis, Ind.

**M**  
W. H. McIntyre Co., Auburn, Ind.  
McLaughlin Motor Car Co., Oshawa, Ont.  
Marathon Motor Co., Nashville, Tenn.  
Marion Motor Car Co., Indianapolis, Ind.  
Maritime Motor Car Co., Ltd., St. Johns, N. B.  
Martin Carriage Works, York, Pa.  
Martindale & Millikan, Franklin, Ind.  
Mason Motor Car Co., Waterloo, Ia.  
Maxwell Motor Car Co., Dayton, Ohio.  
Mercer Automobile Co., Trenton, N. J.  
Meteor Motor Car Co., Shelbyville, Ind.  
Metzger Motor Car Co., Detroit, Mich.  
Mitchell-Lewis Motor Car Co., Racine, Wis.  
Moline Automobile Co., East Moline, Ill.  
Motor Car Mfg. Co., Indianapolis, Ind.

**N**  
Nance Motor Car Co., Philadelphia, Pa.  
National Motor Vehicle Co., Indianapolis, Ind.  
Nardye & Marmon Co., Indianapolis, Ind.  
Norwalk Motor Car Co., Martinsburg, W. Va.  
Nova Scotia Carriage Co., Kentville, N. S.  
Nyberg Automobile Works, Anderson, Ind.

**P**  
Packard Motor Car Co., Detroit, Mich.  
Paige-Detroit Motor Car Co., Detroit, Mich.  
Palmer & Singer Mfg. Co., Long Island City, N. Y.  
Paterson Wagon Works, Flint, Mich.  
Peerless Motor Car Co., Cleveland, Ohio.  
Pilot Motor Car Co., Richmond, Ind.  
Pope Mfg. Co., Hartford, Conn.  
Premier Motor Car Co., Indianapolis, Ind.  
Pullman Motor Car Co., York, Pa.

**R**  
Regal Motor Car Co., Detroit, Mich.  
Renault-Freres Selling Co., New York City.  
Reo Motor Car Co., Lansing, Mich.  
Reo Motor Car Co. of Canada, St. Catharines, Ont.  
Russell Motor Car Co., W. Toronto, Ont.

**S**  
Sayers & Scoville Co., Cincinnati, Ohio.  
Seagrave Co., Columbus, Ohio.  
Selden Motor Car Co., Rochester, N. Y.  
Simplex Automobile Co., New Brunswick, N. J.  
A. O. Smith Co., Milwaukee, Wis.  
South Bend Motor Car Works, South Bend, Ind.  
Spaulding Mfg. Co., Grinnell, Iowa.  
Speedwell Motor Car Co., Dayton, Ohio.  
Stafford Motor Car Co., Kansas City, Mo.  
Stanley Motor Car Co., Newton, Mass.  
Staver Carriage Co., Chicago, Ill.  
F. B. Stearns Co., Cleveland, Ohio.  
Stegeman Motor Car Co., Milwaukee, Wis.  
Sternberg Mfg. Co., Milwaukee, Wis.  
Stevens-Duryea Co., Chicopee Falls, Mass.  
Stoddard-Dayton Co. (Maxwell), Dayton, O.  
Studebaker Corporation, Detroit, Mich.  
Stutz Motor Car Co., Indianapolis, Ind.

**T**  
U. S. Carriage Co., Columbus, Ohio.

**V**  
Vandewater & Co., Elizabeth, N. J.  
Velle Motor Vehicle Co., Moline, Ill.

**W**  
Wayne Works, Richmond, Ind.  
Webb Co., Allentown, Pa.  
Westcott Motor Car Co., Richmond, Ind.  
Wichita Falls Motor Co., Wichita Falls, Tex.  
Willys-Overland Co., Toledo, Ohio.  
Winton Motor Car Co., Cleveland, Ohio.

**Z**  
Zimmerman Mfg. Co., Auburn, Ind.

## Count Them

and you'll see the **CLBA** is the choice of the big majority.

Some of the VERY FEW manufacturers not in this list try to "put it over" on their customers by furnishing an imitation battery claimed to be "just as good" as the **CLBA**.

Your electrical equipment is a highly important part of your car—on its successful operation depends your pleasure, your actual use of the car.

You cannot afford to buy a car whose manufacturers are willing to let you take a chance with any other battery than the **CLBA**.

Five **CLBA** Branches, factory owned and operated and 150 real Service Stations in the United States stand ready to assist you in time of need.

## WILLARD STORAGE BATTERY COMPANY

### CLEVELAND, OHIO

New York Branch: 136 West 52d Street  
San Francisco Branch: 243 Monadnock Bldg.

Indianapolis Branch: 438 and 439 Indiana Pythian Bldg.

Detroit Branch: 1191 Woodward Avenue  
Chicago Branch: 2241 Michigan Avenue

(75)

# Greatest Knight Motor

**\$2400**

Nothing extra to  
pay

## MOLINE-KNIGHT

**\$2400**

Completely  
Equipped

## The car you have long wanted

*More Power—More Flexibility—More Economy—More Silence*

### Guaranteed fifty brake horsepower

The car of the future is here today—a guaranteed fifty brake horsepower "Four" as powerful and as flexible as any "Six"—a big, roomy five-passenger car, ironed for two auxiliary seats, with an electric starter that starts each and every time. The Moline-Knight will be a delightful surprise, with its perfect, graceful, smooth streamline body and foreign air. Moline upholstering quality has been embodied throughout.

### The car of the fu- ture will not have poppet valves

The old poppet valve has outlived its usefulness because high compression, large valves, strong springs and precipitous cams are necessary in the poppet valve engine to get great power and high speed. Here is a weakness the poppet valve will never be able to overcome. In the Moline-Knight there are no valves to clog or grind—no cams, no springs, no timing gears to get out of order.

### Everything you have desired

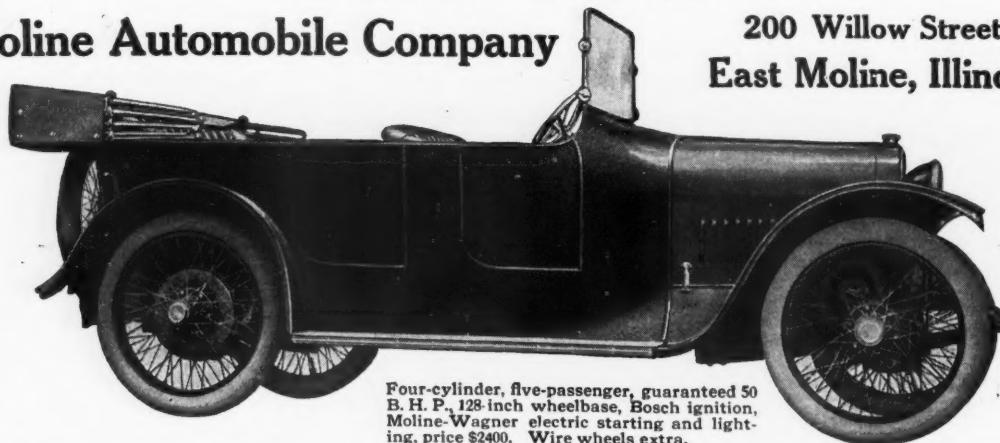
Full floating rear axle, 128-inch wheelbase, selective transmission, half elliptic rear springs of unusual length, Truffault-Hartford shock absorbers, Bosch ignition, Schebler carburetor, Moline-Wagner electric starting and lighting, adjustable foot pedals, center control, left side drive, lubrication by force through hollow shaft, 36x4 1-2 artillery or wire wheels, Firestone demountable rims, 18-gallon gasoline tank in rear, finished in blue-black, other colors optional with three weeks notice. One-man Mohair top, cover and side curtains, automatic wind shield, electric horn, power tire pump, Warner 60-mile speedometer, Goodrich Unit Molded Tires, gasoline and oil gauge and speedometer, foot rail, robe rail, tire irons, complete set of tools, jack, tire repair kit, eight-day clock.

At least investigate—write today for our Advance Information Folder—learn the truth about motors.

Dealers if you can show us you are entitled to a Moline-Knight contract, write or wire us at once.

**Moline Automobile Company**

200 Willow Street  
East Moline, Illinois



Four-cylinder, five-passenger, guaranteed 50 B. H. P., 128-inch wheelbase, Bosch ignition, Moline-Wagner electric starting and lighting, price \$2400. Wire wheels extra.

The "Four" that makes the "Six" unnecessary

MOLINE

KNIGHT





From accurate clocks and other forms of measuring devices, springs have been discarded as inaccurate and unreliable.

Temperature changes affect springs.

Internal friction produced by constant depression and extension tend to make the metal brittle and alter its physical qualities.

Hence—springs are never used where a high degree of precision is required.

Your carburetor cannot be kept accurately adjusted if it has springs in it, any more than a pair of scales can.

All springs have been entirely eliminated from the new self-adjusting Holley—the modern no-moving-parts carburetor which over 225,000 motorists are using—a carburetor with only one adjustment, operating scientifically according to well known Hydraulic Laws—so automatic in its action that it accommodates itself readily to varying temperatures and air pressures.

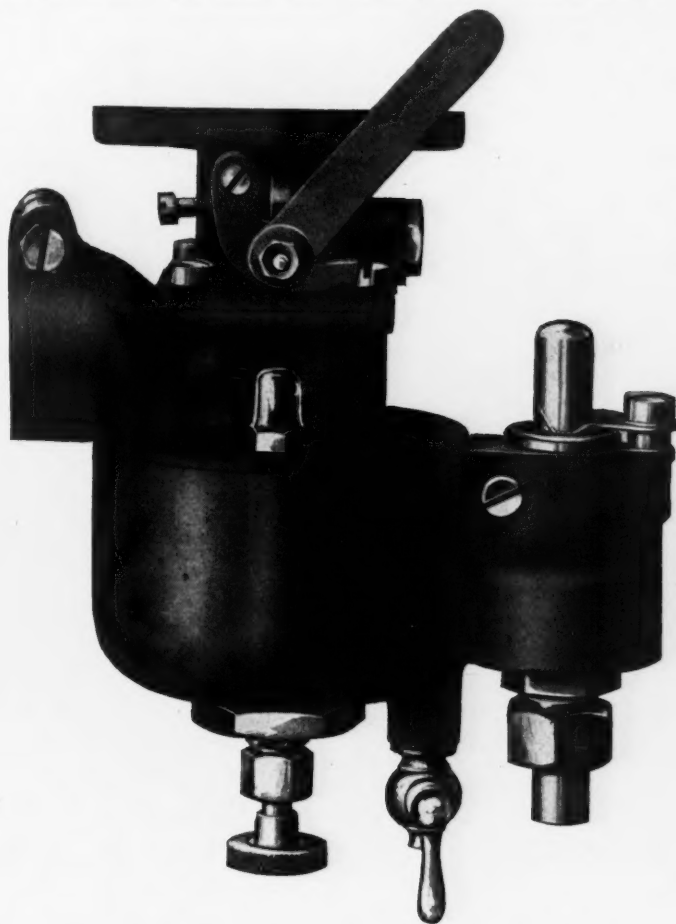
Over 225,000 now in successful use.

You can have one on your car if you desire.

REO ACCESSORIES CO. .... 1220 Michigan Ave., Chicago, Ill.  
OMAHA RUBBER CO. .... Omaha, Neb.  
Foreign Branch: HOLLEY BROS. CO., .... Coventry, England  
Holley Carburetors are carried in stock at the following addresses: CHAS.  
E. MILLER, Home Office: 97-103 Reade St. and 121 Chambers St., New York.

#### BRANCHES:

New York City ..... 924 Eighth Ave., between 54th and 55th Sts.  
New York City ..... 2782 Broadway, between 107th and 108th Sts.  
Springfield, Mass. .... Bridge & Dwight Sts.  
Hartford, Conn. .... 274 Trumbull St.  
Atlanta, Ga. .... 66 Edgewood Ave.  
Brooklyn, N. Y. .... 1421 Bedford Ave.  
Buffalo, N. Y. .... 824 Main St.  
Albany, N. Y. .... 135 Central Ave.  
Detroit, Mich. .... 202-204 Columbus Ave.  
Cleveland, O. .... 1829 Euclid Ave.  
Philadelphia, Pa. .... 318 No. Broad St.  
New Orleans, La. ....  
Newark, N. J. .... 274 Halsey St.



## HOLLEY BROTHERS COMPANY

### DETROIT, MICHIGAN

When Writing to Advertisers, Please Mention Motor Age.

### Prices for 1914

With Worm Gear Axle	With Bevel Gear Axle
5 Passenger Brougham, Detroit Duplex Drive.....\$3,000	5 Passenger Brougham, Front Seat Drive .....\$2,800
4 Passenger Brougham, Rear Seat Drive ..... 2,850	4 Passenger Brougham, Rear Seat Drive ..... 2,550
Gentleman's Roadster ..... 2,500	Victoria ..... 2,300



Model 48. Detroit Duplex Drive

## The Men Who Handle the Best Selling Electric

Detroit Electric dealers rank among the most representative men in their communities. They are known to be substantial.

They have selected the Detroit Electric as the car to handle—either exclusively or along with a gasoline car—for very definite business reasons. They are men of sound business judgment; alert, progressive.

Here are some of the factors that influenced these men largely in their decision:

The builders of the Detroit Electric are the largest manufacturers of electric pleasure vehicles in the world.

They possess the highest possible commercial rating and reputation.

The Detroit Electric is built in the largest electric car factory in America.

Sales of the Detroit Electric are two for one over any other. Double sales mean double profits to the dealer.

The price of the Detroit Electric is right; scientific manufacturing methods on an extensive scale enable us to create

**THE**  
***Detroit***  
**ELECTRIC**

greater quality than in any other electric.

Detroit Electric is safe to drive; it is economical; it has a wide range of mileage.

Detroit Electric is second to none in riding ease, in luxury, in comfort, in beauty.

Detroit Electric possesses more advanced features in mechanism than any other.

Detroit Electric service is of the same high quality as the product; there is quality also in the Detroit Electric guarantee.

You may be located in open territory. It is worth your while to investigate. Write us today for further details.

### Anderson Electric Car Company, Detroit, Mich.

BUILDERS OF "THE DETROIT ELECTRIC"

Largest builders of electric pleasure vehicles in the world



*Push Button and Cable Attachment*

# MOTOPHONE

*Mechanically Operated*

## The Greatest Sensation in Auto-Horn Industry

Operated exactly the same as an Electric Horn EXCEPT

**NO** Adjustments  
Motor Troubles

**NO** Battery Expense  
Electrical Wiring

Just push the button (the same as in a Motor Horn) and a loud, continuous blast is emitted—as powerful as any warning signal made.



Type D, 11" ... \$15  
Type E, 9" ... \$12

## REMEMBER

**The First Cost is the Last Cost**

**Guaranteed for Two Years**

The **Cable Attachment** of the Motophone has been devised and perfected to offer to the trade a mechanical horn having all the characteristics of motor driven (electrical) horns **without** the care of the electric motor, the cost of maintenance, adjustments and the numerous petty annoyances to which the user of the motor horn is subjected.

**Its Action is Positive, Instantaneous, Certain at All Times**

The Motophone is made in five models, as follows:

Type A (Torpedo), 11".....\$12	Type D (with cable attachment), 11".....\$15
Type B (with Oval Bell), 9".....\$10	Type E (with cable attachment), 9".....\$12
Type C (for motorcycles), \$8.00	

## Automobile Supply Manufacturing Company

220 Taaffe Place

INCORPORATED 1904

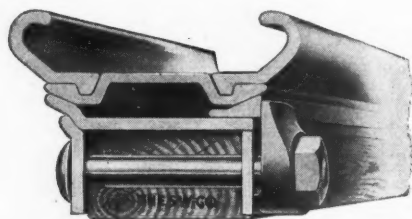
BROOKLYN, N. Y.

# The Number Sixty is a Different Rim

**Y**OU can take the tire off this rim without separating the side-flanges from the casing. You can easily remove the inner tube without disturbing the side-flanges.

Think what that means! You'll never have to waste time and labor separating a side-flange and casing that have "frozen" together.

And the side-flanges that grip and hold the tire to the rim are endless—no rough ends to chafe, rub or cut the tire. That means lessening your tire-expense, and reducing your tire-troubles.



*Cross-Section of Number Sixty-One—Clincher Type*

To get at the damaged tire after you've slipped the rim off the felloe-band, all you have to do is lift the toggle-lock with a screw-driver, and pull out the inner band.

Opening the toggle-lock collapses the inner band so it is smaller than the side-flanges. It slips out easily.

Fastening the toggle-lock is just as easy. A pressure of the foot does it. And the toggle-lock secures the inner band so firmly that the ends can't move, and dirt can't enter. In fact, it makes the inner band practically endless.

Leave any tire on a rim for a considerable time, and the tire is bound to "freeze" to the sides of the rim.

To separate the "frozen" parts is the greatest difficulty of tire-changing.

Heretofore there has been no rim that permitted tire-repairs without first separating the tire from the sides of the rim. In fact, it was thought impossible to design such a rim.

But we have produced it. Judge for yourself the Number Sixty Stanweld Collapsible Demountable Rim.



*Removing Inner Band*

It combines the best features of those rims that have won for us our great success.

It eliminates the objectionable points—the things that damage tires; the things that cause delays; the things that cause accidents; the things that reduce the efficiency of other parts of the motor-car; the things that make tire-changing a difficult, strenuous job, instead of a mere repair-job.

## STANWELD RIMS

Moreover, it's a light rim. With all its strength and mechanical perfection, the Number Sixty is not much heavier than a plain clincher rim.

Surely the high quality and efficiency of the Number Sixty—the time it will save you, when time is worth most; the labor it will save you, when you feel least able to struggle with a tire-changing job; the money it will save you by lessening wear on your tires; and the comfort and safety that it assures—should make you want this new rim.

And you can have the Number Sixty applied to the car you now own, at a very low cost.

You should get it on your new car at no additional cost.

Write for prices and full information.

### The Standard Welding Company

*Pioneers and World's Largest Producers of Rims for Motor Driven Vehicles*

Main Office and Factory CLEVELAND

Branch Offices in

NEW YORK  
U. S. Express Bldg.

CHICAGO  
Peoples Gas Bldg.

DETROIT  
Ford Bldg.

*Distributors in Principal Cities of the United States*



# Stewart-Warner Speedometer Service

## The Largest Number of Direct Factory Branches

Atlanta, Ga., 399 Peachtree St. Indianapolis, Ind., 514 N. Capitol Ave. Pittsburgh, Pa., 301 N. Craig St.  
Boston Mass., 174 Columbus Ave. Kansas City, Mo., 1825 Grand Ave. St. Louis, Mo., 3333 Olive St.  
Buffalo, N. Y., 724 Main St. Los Angeles, Cal., 115 E. 10th St. San Francisco, Cal., 1447 Van Ness  
Chicago, Ill., 1312 Michigan Ave. Minneapolis, Minn., 635 3rd Ave. S. Ave.  
Cleveland, Ohio, 1831 Euclid Ave. New York, N. Y., 233 W. 58th St. London, England.  
Detroit, Mich., 1235 Woodward Ave. Philadelphia, Pa., 608 N. Broad St. Paris, France.

We do not list a lot of jobbers, accessory dealers, garages, repair depots and gasoline stations and call them branches. Our branches are direct factory branches, completely stocked and in charge of our own factory trained staff.

## The Greatest Chain of Service Stations

Albany, N. Y., 288 Central Ave. Hartford, Conn., 14-16 Wells St. San Antonio, Texas., 429 Main St.  
Baltimore, Md., 146 W. Mt. Royal Ave. Houston, Texas, 1311 Main St. San Diego, Cal., 1100 "A" St.  
Birmingham, Ala., 519-521 S. 20th St. Jacksonville, Fla., 925 Main St. S. Paola, Brazil, So. America.  
Bridgeport, Conn., 433 Canon St. Louisville, Ky., 628-32 3rd St. Springfield, Mass., 317 Dwight St.  
Brooklyn, N. Y., 1186 Bedford Ave. Memphis, Tenn., 276 Monroe Ave. Seattle, Wash., 317 E. Pike St., 916  
Buenos Aires, Argentine Republic, Milwaukee, Wis., 234 Lake St. E. Pike St.  
So. America. Montreal, Que., Can., 97 Belury St. Syracuse, N. Y., 514 E. Genesee St.  
Calgary, Alta, Can. Newark, N. J., 237 Halsey St. Spokane, Wash.  
Christ Church, New Zealand. New Orleans, La., 613 Baronne St. Sydney, N. S. W., Australia.  
Cincinnati, Ohio, 925 Race St. Norfolk, Va., 2005 Brambleton Ave. Toledo, Ohio, 2233 Madison Ave.  
Dallas, Texas, 1922 Main St. Omaha, Neb., 2119 Farnum Ave. Toronto, Ont., Can., 5 Wood St.  
Dayton, Ohio, 102 N. Main St. Oshawa, Ontario, Can. Transvaal, S. Africa.  
Davenport, Iowa, 217-221 Iowa St. Portland, Maine, 18 Free St. Trenton, N. J., 315 So. Broad St.  
Denver, Colo., 1616-1618 Broadway. Portland, Ore., 31-33 N. Broadway. Vancouver, B. C., Can., 825 Pender  
Des Moines, Iowa, 12th & Locust St. Providence, R. I., 121 Fountain St. St., 516 Howe St.  
Edmonton, Alberta, Can. Puteaux Seine, France. Washington, D. C., 1328-1330 New  
Erie, Pa., 1721 Sassafras St. Regina, Sask., Can., 947 Rose St. York Ave., N. W.  
Ft. Wayne, Ind., 115 Washington St. Richmond, Va., 106 N. 8th St. Wanganui, New Zealand.  
Hamburg, Germany. Rochester, N. Y., 205 State St. Salt Lake City, Utah, 36 W. 2nd St. Winnipeg, Ont., Can.

These are real service stations. Not merely a "place" which carries a couple of speedometers; not "places" that cannot make actual repairs under our guarantee. Each Stewart-Warner service station is fully equipped—in charge of and operated by experienced Stewart-Warner Speedometer men, to take care of all speedometer wants, repairs, adjustments and replacements.

## The Fairest and Most Liberal One Year Guarantee

*We will repair or replace absolutely free of charge at our factory, branches or at any of our authorized service stations any Stewart Speedometer or Warner Auto-Meter or part that proves defective in material or workmanship within one year from date of sale to car buyer, providing transportation charges have been prepaid. This guarantee does not cover fiber pinions.*

## Stewart-Warner Speedometer Corporation

Factories: Beloit, Wisc. Chicago, Ill.

# The New Keeton—The Voiturette's New Car-Nation



The New 7-Passenger "6-48" Keeton

Embodying the same general design the new "Six-48" Keeton has been refined in detail and brought up to the plane of good sound mechanical construction in every respect.

The new car has been thoroughly tested out over some of the worst roads in the country, in a conscientious endeavor to find a weak spot, and in a run of over 9,000 miles the only trouble encountered was a broken leaf in a front spring.

Operated on a sound financial basis by executives whose good common sense and fairness cannot fail to impress, the Keeton Motor Company is

well qualified to carry out any contracts it may undertake.

These agency contracts are of such a nature as to insure material benefit to both parties and the fullest cooperation on the part of the factory.

It will pay you to get in touch with us at once.

## Keeton Specifications

Electric starting.  
Full electric light equipment.  
Six cylinders cast en bloc, large valves.  
Four inch bore—five inch stroke.  
All moving parts completely enclosed.  
Exceptionally powerful and flexible.  
Radiator at rear of motor in proper and protected position.  
Centrifugal Pump and large fan on flywheel insure ample cooling.  
Four speeds forward in transmission.

Direct on 3rd—geared up on 4th.  
Left hand drive—right hand control.  
Wire wheels—with extra detachable wire wheel.

Long 136-inch wheel base—long springs, special alloy spring steel, nearly flat under load.

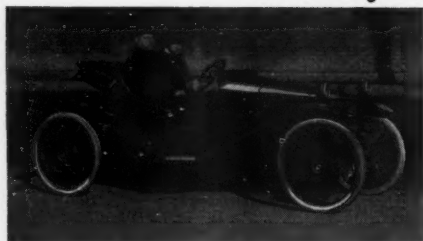
Chrome Vanadium Gears and Shafts on imported annular bearings.

Pressure gasoline feed.  
Very roomy and comfortable bodies.  
Best of foreign practice adapted to American roads and touring conditions.  
Very complete and detailed equipment.

## Models and Prices

2 pass. roadster .....	\$3,250
3 pass. convertible Cabriolet roadster ..	3,500
5 pass. Touring phaeton .....	3,250
7 pass. Touring .....	3,250
7 pass. Limousine .....	3,850

## First Cycle-Car to Appear on Detroit Streets



2 PASSENGER ROADSTER

America's first cycle car—The Car-Nation—is now being produced, and demonstrators are being delivered to agents.

The Car-Nation has been thoroughly tested out under all conditions and has proven a revelation in power, economy, ease of handling and speed.

Dealers—Look over the specifications and see for yourself the extraordinary value in this car. You will see that the specifications contain the same features as appear in those of the big high-priced cars.

## Car-Nation Specifications

**Unit Power Plant**—Motor, 4-cylinder en bloc, 3½x3¾; "L" head, large valves and bearings, very quiet and powerful.



2 PASSENGER TANDEM (FRONT VIEW)

**Ignition**—High tension magneto; fixed spark.

**Lubrication**—Constant level splash; plunger pump.

**Carburetor**—Automatic float feed type, very economical.

**Cooling**—Thermo syphon; V shaped radiator; adjustable belt-driven fan.

**Clutch**—Multiple steel disk type running in oil.

**Transmission**—Selective type, 3 speeds forward and reverse; One-lever control.

**Drive**—Bevel gear through concentric torque tube with one universal joint.



4 PASSENGER CAR-NATION

**Rear Axle**—Semi-floating types; Hyatt roller bearings.

**Brakes**—Emergency, internal exp. on 10" drum on rear wheels; Service, external contracting on transmission shaft.

**Wheels**—Detachable wire, 30x3" clincher rims and smooth tread tires.

**Control**—Left-hand drive, center control.

**Wheelbase**—104".

**Tread**—48".

**Standard Equipment**—Oil head lamps and tail lamp, with set of tools.

**Prices**—Model A, 2-pass. roadster, \$495; Model B, 2-pass. tandem type, \$510; Model C, 4-pass. touring car, \$520.

**Extra Equipment**—Top, \$25.00; windshield, \$10.00; extra wire wheel, \$10.00; electric horn, storage battery, 3 electric lights and switch, \$30.00.

Manufactured  
by

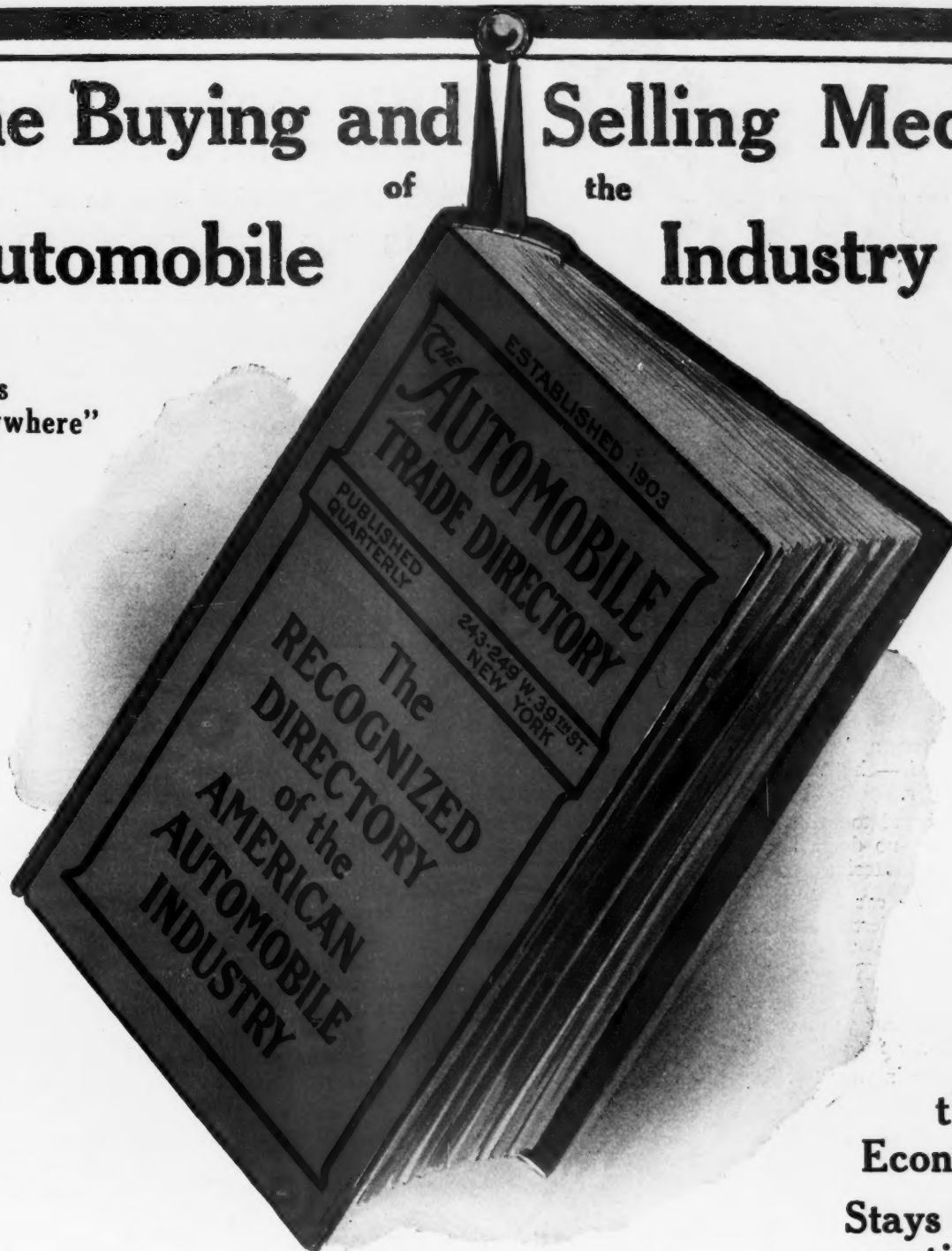
**KEETON MOTOR CO., Detroit, U. S. A.**

See our Exhibits at  
New York and Chicago



# The Buying and Selling Medium of the Automobile Industry

"It  
Hangs  
Everywhere"



Reaches  
the Buyer  
Economically!  
Stays with him  
continuously!

The judicious advertising medium of the automobile trade used by  
nearly 1,000 advertisers, because—  
**IT PAYS**

## THE AUTOMOBILE TRADE DIRECTORY

243-249 West 39th Street

NEW YORK

*When Writing to Advertisers, Please Mention Motor Age.*

# Paterson

## "32"

**THIS** Announcement is addressed to those dealers who are seeking a line that needs no introduction—because the specifications are right—because the price is right.

*2-Passenger Runabout at*

# \$1147

The Paterson "32" and "33" are built around the same chassis—the "32" is the Roadster, the "33" the Touring Car.

The demand today is for the popular-priced car—we have it—no detail has been overlooked in its design, in the material used or in its equipment.

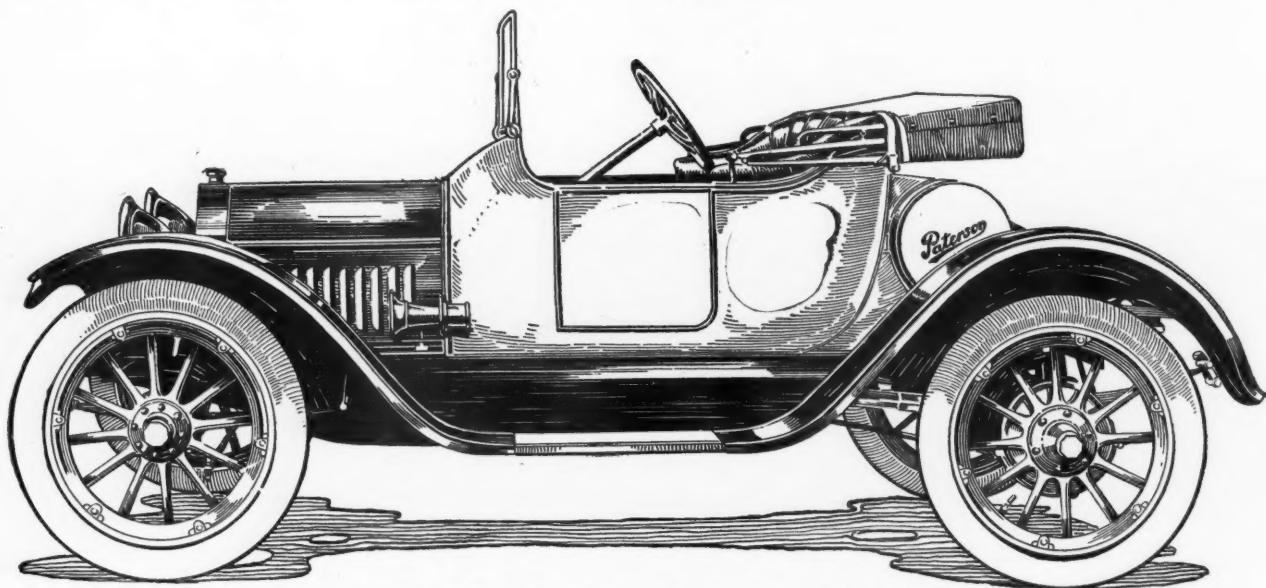
Think of a car for less than \$2,000 with a Northway motor, Weston-Mott axles, Jacox steering gear, Delco Electric Lighting and Starting System—equipped with Electric Horn, Speedometer, Windshield, Top and Demountable Rims.

*This is the car you can sell in quantities—because it appeals to the popular demand.*

What line in your territory can compete with THE

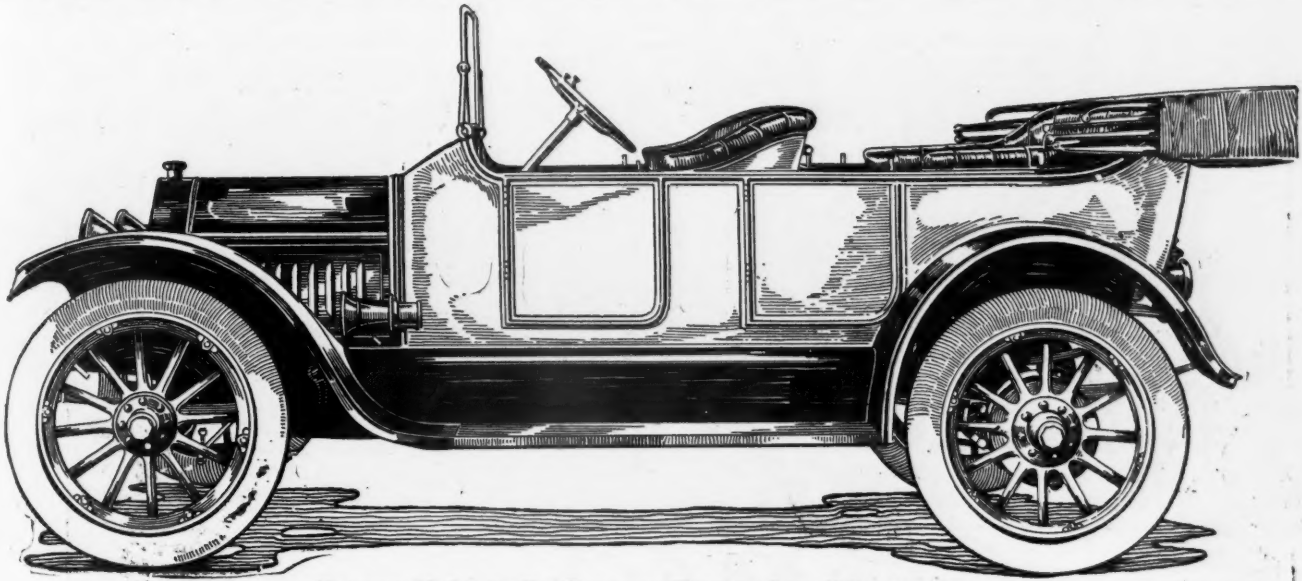
PATERSON in price? You don't need a microscope to see that this is the line for you to represent. You know that delays are dangerous—because there are others right in your midst who will "hustle while you wait" (if you wait). We are looking for dealers who are on the job and know a line that merits more than the usual consideration after they have analyzed it—that's the PATERSON.

Just a word to the wise—the W. A. Paterson Company has been in business for over 45 years. This is a safeguard every dealer should consider first in order to protect his reputation—because your customer, the purchaser, must be protected as well as yourself—if you expect to retain his good will—and that is your biggest asset.



Paterson Model "32" 2-Passenger Roadster—Price \$1147





Paterson Model "33" 5-Passenger Touring Car—Price \$1197

## Paterson Specifications Bristle With Selling Arguments

These Specifications Are Common to Model "32" and "33"

**MOTOR:** Special 4-cylinder Northway.

**WHEEL BASE:** 112 inches.

**AXLE:** Weston-Mott, with high duty Hyatt-Quiet Bearings throughout.

**IGNITION:** Delco.

**STARTING:** Delco.

**LIGHTING:** Delco.

**RADIATOR:** "Long" cellular.

**FRAME:** Single drop.

**TRANSMISSION:** 3 speeds forward, 1 reverse.

**CONTROL:** Center.

**SPRINGS:** Front, semi-elliptic; Rear,  $\frac{3}{4}$  elliptic.

**WHEELS:** Imperial, artillery type, Fitted with demountable rims.

**CLUTCH:** Cone type, leather faced.

**BODY:** Flush sides, concealed hinges, inside door handles, ample sprawl room.

**EQUIPMENT:** Mohair top, windshield, speedometer, electric horn, interior dash lights, extra demountable rim, tool kit, jack, pump, tire repair kit, etc.

*5-Passenger Touring Car at*

# \$1197

We are interested only in dealers who can give THE PATERSON line high-class representation.

Investigate now—Your territory may be open. Come and see us. Write or use the Western Union.

**W. A. Paterson Co.**  
Flint, Michigan

*Paterson*  
"33"

*When Writing to Advertisers, Please Mention Motor Age.*

**1**  
JAN.1  
NEW YORK  
BEFORE-  
SHOW  
ISSUE

**2**  
JAN.8  
NEW YORK SHOW  
RESUME  
ISSUE

**3**  
JAN.15  
INTERNATIONAL  
ISSUE

**4**  
JAN.22  
CHICAGO  
BEFORE  
SHOW  
ISSUE

**5**  
JAN.29  
CHICAGO SHOW  
RESUME  
ISSUE

# The BIG 5

Each point of the star presents a decided merchandising advantage. Space in the "Big Five" January issues of The Automobile and Motor Age will result in a mighty good advertising investment for you.

There are definite reasons why this is so.

Please write us today and say that you want complete information.

**THE CLASS JOURNAL CO.**

239 W. 39th Street  
NEW YORK

910 So. Michigan Ave.  
CHICAGO



# Heat Your Garage This Winter



Also used  
in Sun  
Porches, Offices,  
Store Rooms, Etc.

*It means Comfort and  
Car Efficiency*

For  
Artificial or  
Natural Gas

PRICE  
**\$25**  
Freight Prepaid

**R**OLL up your sleeves, light the Jimmy Pipe and spend that idle winter evening in your garage, tinkering on the car—fix a flat tire or polish the nickel without endangering your health and enjoy the same comfort as you would in your parlor.

## The Scientific Safety Garage Heater

That's what you can do if you own a *Scientific Safety Garage Heater*, the only heater on the market designed especially for garage use.

### "Start Your Car on a Winter Day as Easy as the Summer Way"

No more starting trouble, simply give the crank a quarter turn or touch the starter button and your motor responds the same as in summer. Your radiator and water jackets cannot freeze, and a car will not depreciate. The lustre of paint lasts, parts are free from rust, the oil flows readily and the car will not sweat.

In heating the warm air passes out at the top so that hardly any heat is given off at the sides. You can stand your car right next to the heater without blistering or scorching. If you own an Electric, and do your charging at home, the heater is a necessity as batteries will take full charge.

#### INSURANCE MEN ENDORSE IT AS ABSOLUTELY SAFE

Insurance boards everywhere endorse the Scientific Safety Garage Heater as absolutely safe. It does not increase the insurance rate. Built on the Miner's Lamp principle, gasoline fumes cannot ignite. You may pour gasoline all over or around it and it will not explode.

#### FUEL COST IS VERY SMALL

Consumes either artificial or natural gas at a small monthly cost. Simple and inexpensive to install and will last forever. Only one match is necessary to operate the heater all winter long. All fumes are vented to the outside air. Occupies what would otherwise be waste room. It heats the ordinary two machine garage from freezing to 70 degrees in a very short time. The heater is 40 inches high, 45 inches long and 9 1/4 inches deep. It is made of the finest materials and is an ornament to any garage.

**You need the Scientific Safety Garage Heater if you want comfort, convenience and car efficiency this winter**

#### SECURE A COPY OF THIS BOOKLET NOW!

For convenience fill in the attached coupon today and we will send you our valuable booklet, "Protecting Your Car in Winter," as well as our 15 day free trial offer.

The  
Scientific  
Heater Co.  
1400 Power Ave.  
Cleveland, O.

Send me your booklet, "Protecting Your Car in Winter," and all other information regarding your Scientific Safety Garage Heater. Approx. size of my garage.....

Name .....

Address .....

## The Scientific Heater Company

*The Largest Builders of Gas Heating Apparatus in the World*  
**1400 Power Ave. Cleveland, Ohio**

*When Writing to Advertisers, Please Mention Motor Age.*



# What the Head Mechanic



**T**HE biggest dealer in a real live town wired the Jeffery Company the other day, asking for consideration as a dealer for his locality. Then he got on the train and came to Kenosha.

Before he left, his head mechanic said to him, "Now look here! Don't you be deceived by advertising. You find out these things about this car before you take it on."

Then he wrote out a list of questions, which the dealer placed in his pocket, and when he reached the factory it was handed to the factory manager. The list as returned, with the answers given, appears below. The dealer closed for the Jeffery line immediately after seeing the factory and the car.

## Here Are the Questions and Answers

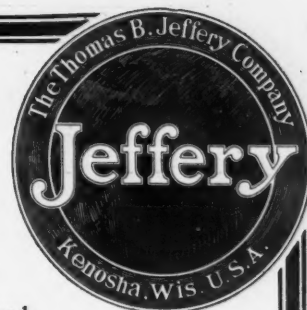
If you think of any others, just fire them in. They are welcome. There is no question about the Jeffery car that you can ask that we are not proud and even anxious to answer.

- |   |   |
|---|---|
| Q. Is self starter dirt and water-proof?                    | A. Not seamless but of very rigid construction. Seams double lapped throughout.             |
| A. Yes.   | Q. Is gasoline line carried in the proper manner?   |
| Q. How about cut-out and control of charge?                 | A. Yes, carefully protected by frame side rails.  |
| A. Automatic, easily adjustable to meet conditions.         | Q. How are spring hangers mounted on frame?   |
| Q. Is the wiring simple?                                    | A. Spring hangers of generous proportions are securely riveted to main frame.               |
| A. Yes, simple and carefully protected from oil and grease. | Q. Are spring shackles loose and noisy?   |
| Q. Are dry cells used?                                      | A. No. Spring shackles are fitted with castellated nuts and cotter pins to insure rigidity. |
| A. Yes, for starting.                                       |   |
| Q. Is gasoline tank seamless?                               |   |



# Told the Boss To Do!

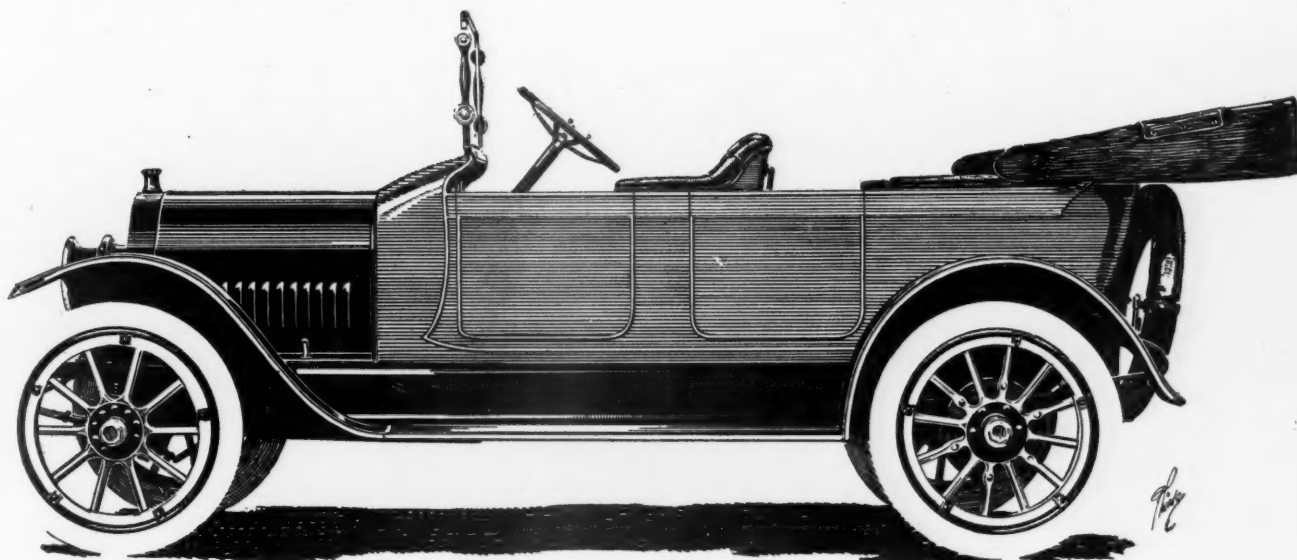
## Here Are the Questions and Answers (Con't.)



- Q. Are springs bushed?  
A. Yes.
- Q. How are spring bolts lubricated?  
A. Zerk compression grease cups. High grade.
- Q. How is body fastened to frame?  
A. Firmly bolted through heavy oak sills and frame side rail.
- Q. How is fan driven?  
A. Adjustable V belt, insuring positive drive.
- Q. Is magneto accessible?  
A. Yes, very easily so by raising left side of hood.
- Q. How is pan put on?  
A. Securely bolted to frame side rails, crank case flanges and cross girders.
- Q. What are the makes of the front and rear axles?  
A. Vanadium steel drop forged I beam front, Jeffery manufacture, weight 29 pounds. Salisbury full floating rear on Jeffery Four. American full floating rear on Jeffery Six.
- Q. What kind of steering gear?  
A. Gemmer, strictly high grade, used generally by manufacturers of the higher priced cars.
- Q. How is the steering gear mounted on frame?  
A. Securely bolted to reinforced side rail.
- Q. Are gears noisy in fourth speed?  
A. No. A little more quiet than any we know.
- Q. How is leg room in driver's seat?  
A. Ample—front vestibule being very roomy.
- Q. Are shifting levers in the way?  
A. Levers are so located as not to interfere in any way with entering from either side of car.
- Q. What kind of demountable rims are used?  
A. Funk, straight side easily removed.
- Q. What kind of top and curtains?  
A. Top of high grade "Neverleek" material with curtains permanently located, rolling up inside of top.
- Q. Is wind shield a good one?  
A. Yes, easily adjustable rain vision shield of Jeffery manufacture. Shield is set into cast sockets on cowl, doing away with the necessity of stay rods.
- Q. Are radius rods used?  
A. No. A single torque rod in center.
- Q. How is front end of torque suspended?  
A. Spring cushioned ball joint fastened to cross member of frame.
- Q. What about fenders?  
A. Hand rolled, one piece crowned fenders—spot welded to fillers and fender brace, doing away with visible bolts or rivets.
- Q. How long will starter crank motor with one charge of battery?  
A. Under normal conditions from six to ten minutes.
- Q. What kind of storage battery is used?  
A. U. S. L. battery.
- Q. Are parts accessible?  
A. Yes, very easily so by removing floor boards of the vestibule.
- Q. Does car look as good as the picture?  
A. Better. The Jeffery body appeared at the Paris show when stream-line was popular. It immediately took the eye of the Parisians and was brought to this country by Rothschild, and first introduced to the American public by Jeffery.

## The Thomas B. Jeffery Company

Main Office and Works : : : Kenosha, Wisconsin



The Jeffery Four, \$1550

SAFETY FIRST

GOODRICH SAFETY TREAD

**The big thing in saving  
needs is lower prices first**

and as usual we are the first to  
name them to the user.

Find listed below the exact prices  
on a number of the popular sizes  
of the

**Accepted standard  
non-skid tire**

28 x 3	\$11.85	36 x 4	\$27.75
30 x 3	- 12.65	35 x 4½	36.05
30 x 3½	17.00	36 x 4½	37.10
32 x 3½	18.10	37 x 4½	38.15
33 x 4	- 25.25	36 x 5	- 43.15
34 x 4	- 26.05	37 x 5	- 44.45
35 x 4	- 26.90	38 x 5½	57.30

(Effective Nov. 24, 1913)

**Don't pay more**



Factories:  
Akron, Ohio

Branches in All  
Principal Cities

**The B. F. Goodrich  
Company**



*There is  
nothing in Goodrich  
Advertising that isn't  
in Goodrich Goods*

When Writing to Advertisers, Please Mention Motor Age.



# Scientific American Reference Book

For 1914

A MODERN BUSINESS NECESSITY

"Those who know the Reference Book will want the new edition at once. Those who do not will save time and money by getting it and learning how to use it."—New York Sun.

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A Really Important Work

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"It is far and away the best and most useful of all Reference Books."

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"It is practically indispensable in its field."

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In this great book are gathered the statistics and information necessary to answer with accuracy the perplexing questions which constantly arise relative to modern processes, discoveries and achievements, and their bearing on our industrial and commercial progress. A great deal of the information it contains can be found nowhere else. The illustrations are not mere pictures but are designed to fix facts and events upon the memory by means of instructive object lessons. In preparing the material for this work its editors have collaborated with the most eminent authorities. Every page has been revised or written by an expert, and the book contains much accurate data that cannot be found in many of the high-priced encyclopaedias.



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"In all probability there has never been published a book of its kind as thorough and as useful."

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We have reserved a very limited number of copies of the new 1914 edition for circulation purposes. Tear off the attached coupon and send it to us with \$3 in payment for a bona fide new subscription for "Scientific American" and we will send you a copy of the book, express charges prepaid and absolutely free.

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## SCIENTIFIC AMERICAN

tells in simple language the things that have made the real history of the world. Today it is bigger, broader and more comprehensive than ever.

The one necessary magazine for the man whose business success depends upon the great mechanical, engineering, electrical and scientific achievements that are rapidly developing the resources of this country and making them of great value to its citizens.

Remember that we have reserved only a limited number of copies of the new 1914 edition of the Reference Book for this purpose and we cannot guarantee to send the book after this supply is exhausted, hence **YOU MUST ACT PROMPTLY**. Don't delay—don't miss this chance. Fill in and return this coupon today

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MUNN  
& CO., Inc.

Send me Scientific American Reference Book and enter subscription for Scientific American as per offer. \$3.00 enclosed.

Name.....

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The advertisement features a central graphic of a ball bearing with a globe inside it. The globe is labeled with 'HERE' on the left, 'THERE' on the right, and 'EVERYWHERE' at the bottom. The bearing is surrounded by a decorative border of many smaller ball bearings. The text 'R.I.V. Ball Bearings' is arched over the top of the bearing, and 'QUALITY' is written in large, bold letters below it.

# R.I.V. Ball Bearings QUALITY

## In *QUALITY* They Lead the World

Experts quickly discriminate between the external features of a motor car and those features that are not observed by a casual inspection. R. I. V. Ball Bearings in a car immediately convince the expert that it is a *Quality* car.

Real value has put R. I. V. in a class by themselves and has resulted in a steadily increased output year by year and a continuance of Superior Quality.

There is an advertising value in cars equipped with R.I.V. Ball Bearings.

**R. I. V. COMPANY**  
 1771 Broadway, NEW YORK  
 Imported Since 1904



Stutz owners never say "I drive a car"—  
they always say—  
**"I drive a Stutz"**

If you are a Stutz owner you know this to be true. When you get your Stutz, if you do not own one now, you will say it, too.

**Stutz owners are Stutz  
Boosters**

You will never live to see the day when a Stutz owner will apologize because he drives a Stutz—he needs no excuse—he is justly proud of his selection.

In buying a car, don't do yourself the injustice of making a selection without first seeing the four and six cylinder Stutz in the new models.

You won't find any radical mechanical changes—they were not necessary. Just a few touches here and there have been added—more generous upholstery, springs a little longer, with greater service and power.

**Electric system in separate  
units**

When you go to your nearest Stutz dealer, ask him to explain to you the Electric Starting, Lighting and Ignition Systems. He can prove to you that separate units are more simple, more dependable and more easy of operation.

There are other Stutz features that will appeal to you—the Cone Clutch—the 4 3-4x5 1-2 T-head motor in the 4-cylinder and the 4x5 T-head motor in the 6-cylinder model—the famous Stutz special Rear System—Timken front axle—Gemmer Steering Gear—Force Feed Oiling System through hollow crank shaft.

*Write for our new illustrated catalog No. A-2—Series E.*

Dealers: We still have a little desirable territory open and will make a profitable contract with responsible dealers. Write or wire quick.

**Stutz Motor Car Company of Indianapolis**



**SIX-PASSENGER TOURING CAR**

Four-Cylinder, \$2150  
Six-Cylinder, - 2400

**STUTZ — the car that made good in a day**

*When Writing to Advertisers, Please Mention Motor Age.*

STUTZ — the car that made good in a day

STUTZ — the car that made good in a day



# What a Well Organized Delivery Car Department Means to Every Automobile Dealer

**I**F you are a progressive and successful dealer, you are interested in this question:

"Is it good business not to have a well organized Delivery Car Department?"

We believe we can show you that it is **not** good business.

You know the pleasure car business. You know that it's "streaky." You know that it is heavy today and light tomorrow, and that your overhead is as sure as death and taxes.

Some dealers—the successful and progressive dealers—have realized that it is not good business judgment to invest all their capital—or most of their capital—in garage, service, building, show rooms and salaried sales-force for the sale of pleasure cars exclusively.

These dealers have found a way to equalize the fat months and the lean, to carry the overhead until it carries itself; in a word, to change their business from a fickle, erratic trade, fluctuating with the seasons, to a steady twelve-months business.

These dealers have found and installed and developed the profitable delivery car department.

To them and to you—if you are among such progressive and successful dealers—The Commerce Motor Car Company has much to say.

In the first place, you must distinguish clearly between delivery cars built on pleasure car chassis (which have been unhappy and inevitable failures) and the Commerce Car, which is designed and constructed as a "fool-proof," efficient delivery car—and nothing else.

In the second place, you must separate your pleasure car selling force and your delivery car selling force. You must organize and operate them—separately.

That done, you are ready for the extraordinary opportunity the Commerce Car offers you.

The Commerce Car is three years old—three years of service-giving, reputation-building and hard work. We have gone slowly—because we wanted to be sure and we wanted our Commerce owners and Commerce dealers to be sure.

You can sell the Commerce Car—with enormous success—if you sell it to business men as cash registers and adding machines are sold to business men—and send out diligent, intelligent, methodical and rational men to sell it.

You can confirm all we say of the Commerce Car by asking Commerce Car owners themselves. We will give you names and addresses and detailed reports.

If you are in the automobile business for steady, consistent growth and permanent, legitimate profits;

If you will organize a delivery car department on the right basis and maintain an alert delivery car sales-force;

If you will contract with us and work with us and build with us in the right spirit:

The Commerce Car will give you a twelve-months profitable business and a twelve-months success.

Write or wire for details. Or, better yet, come to Detroit, see the materials we are putting into Commerce Cars, and sense the spirit of the whole organization.

## The Commerce Motor Car Company

Administration Department, 625-630 Penobscot Bldg., Detroit, Michigan



### Specifications:

1,000-pound capacity, 25 per cent. overload, guaranteed.

Equipment, including electric horn, complete.

32 x 3½ Goodyear pneumatic tire, or

34 x 2½ Goodyear Motz truck tire.

Express, full panel, or canopy top.

Clear floor space—  
64 inches long;  
42 inches wide;  
52½ inches high.

Gear ratio—  
6 to 1 on high;  
20 to 1 on low.

Friction drive.

Wheelbase—102 in.

When Writing to Advertisers, Please Mention Motor Age.

**The bearings in your car are a vital part. The dependability that you can place in the car depends upon the reliability of the bearing.**

**The reliability of Hyatt Roller Bearings is responsible for their almost universal adoption in every type and class of car built from the smallest run-about to the most luxurious six.**

**Today there are nearly 10,000,000 Hyatt Roller Bearings in daily service.**

Two books, one about motor car bearings in general for prospective purchasers, the other for automobile owners, will be sent on request

*"Hyatt Quiet Bearings"*



**HYATT ROLLER BEARING Co.**  
DETROIT, CHICAGO  
NEWARK, N.J.



ARBECO, the "ALL-GLASS" feature lamp that has distinguished auto lighting for 1914, is preferred by motorists of discerning judgment. It is made for those who purchase only "the best," as it embodies exclusive features instantly recognized as the ultra essentials of "class."



### "Take Daylight With You When You Drive At Night"

The Parabolic "All-Glass" silvered mirror reflector projects an intense, yet wonderfully mellow glow, that lights the entire road. The nearest approach to daylight by far. Remember that the "color-trim" of the body is made to match the individual trim of the car. Remember that individual monogram or crest is "inlaid" on special orders.

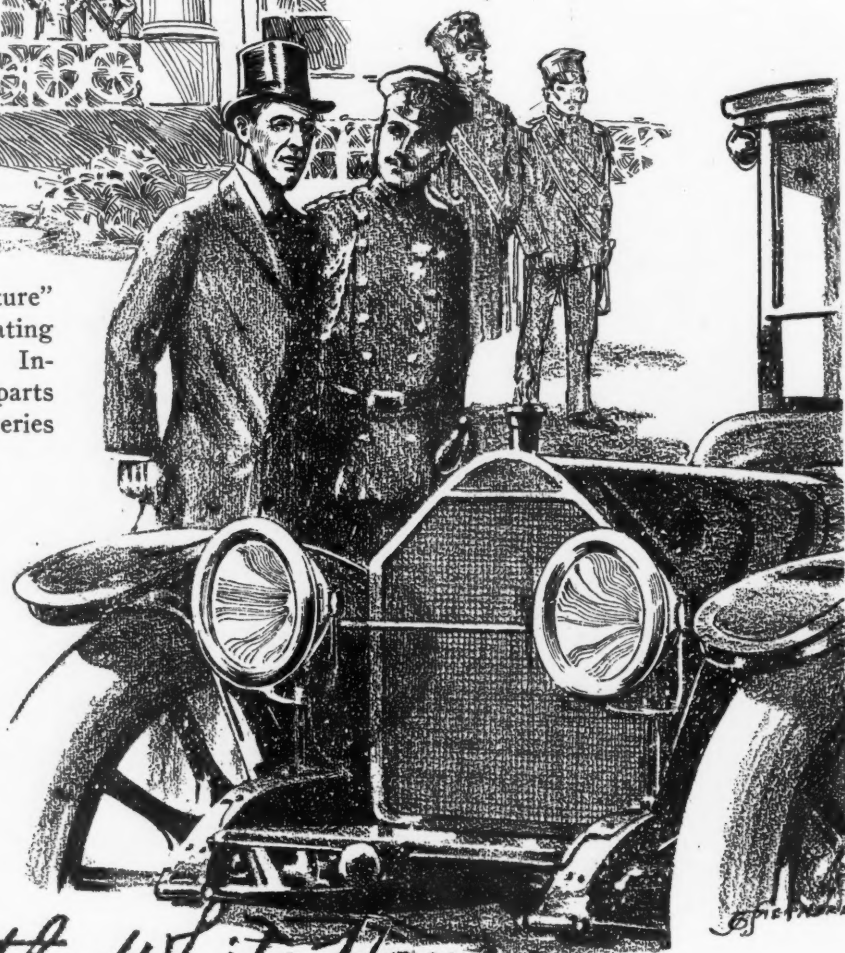
The ARBECO is the only "feature" lamp made. For this reason it is creating unusual attention wherever shown. Inquiries are being received from all parts of the U. S. We are now making deliveries to motorists all over the country.

#### We Have An Excellent Proposition for the Dealer

Write today and secure the agency of this live accessory for your locality.

#### The Reynolds-Browne Company

1312 South Michigan Avenue  
CHICAGO, U. S. A.



*"Arbeco" at the White House*

When Writing to Advertisers, Please Mention Motor Age.



# *Mitchell* Little Six

## Completes Non Stop Run of

# 2563 MILES

### A New American Record for Six Cylinder Cars!

Under the most adverse weather conditions, with its hood locked and sealed personally by John H. Dailey of Pittsburgh, director of the department of public safety, a Mitchell Little Six completed on November 29th a non-stop motor run of 2563 miles—a feat never before accomplished in this country by a 6-cylinder car.

At the finish the motor was running perfectly. Expert engineers who examined the motor after the seals on the hood were broken expressed their opinion that it could easily have run 5000 miles without mishap. No water was taken on throughout the entire trip. The run took place over the city streets of Pittsburgh, and over the worst country roads that could be found within a radius of 200 miles of the city. It lasted six days.

#### Affidavit

November 26, 1913.  
This is to certify that on Monday, November 24th, 1913, at 12:35 P. M. I witnessed the sealing of the self-starter on a Mitchell car and personally placed the Yale locks on the hood of said car, one on each side, and kept two keys for each lock. The speedometer showed zero. A thorough examination by me showed the key holes in each lock covered with metal sealing as did the box over the self-starter. I observed just how the sealing was done. At 12 noon, November 26th, 1913, the speedometer showed 1,005 miles and the sealing on the self-starter box and the locks were the same as when the car began its run. I was requested not to open the locks, as an additional run was to be made and at this time, 12:00 noon, November 26th, 1913, the car has traveled 1,005 miles and there is no evidence of an attempt to tamper with the seals applied in my presence.

JOHN H. DAILEY,  
Director Department Public Safety.

Sworn and subscribed before me this 26th day of November, A. D. 1913. Elias J. John,  
Notary Public.

The run, at first scheduled for only 1000 miles, was extended because of the superlative manner in which the Mitchell Little Six acquitted itself in the face of the most unfavorable circumstances—roads that were almost impassable—uncertain changes in temperature and humidity which try the worth of a motor as nothing else can.

#### Mitchell Models for 1914

Mitchell Little Six—fifty horse power—132 inch wheel base—36 x 4½ in. tires—two and five passenger capacity.... **\$1,895**  
Mitchell Big Six—sixty horse power—144 inch wheel base—37 x 5 in. tires—seven passenger capacity..... **\$2,350**  
Mitchell Four—forty horse power—120 inch wheel base—four cylinders—36 x 4½ in. tires—two and five passenger capacity..... **\$1,595**

All Prices F. O. B. Racine, Wis.

#### EQUIPMENT FOR ALL MITCHELL MODELS INCLUDED IN PRICES AS GIVEN

Electric self-starter and generator—electric lights—electric horn—electric magnetic exploring lamp—mohair top and dust cover—Tungsten valves—Jiffy quick-action side curtains—quick-action two-piece rain vision windshield—demountable rims with one extra—Speedometer—double extra tire carrier—Bair bow holders—license plate bracket—pump, jack and complete set of first-class tools.

**DEALERS AND MOTORISTS:** The performance of this record-breaking Mitchell Little Six carries a message of SERVICE to you. Better investigate further before you decide on that 1914 car. Write us.

*Mitchell-Lewis Motor Co.*  
**Racine, Wis., U.S.A.**

80 Years of Faithful Service to the American Public

# This Is Vital to Every Owner OF A Maxwell-Briscoe Motor Car

Made at Tarrytown, N. Y., and New Castle, Ind., 1905 to 1913

Also to all owners of Stoddard-Dayton, 1905 to 1914; Columbia Gasoline and Electrics, 1906 to 1914; Everitt Cars of Any Model; Brush, Sampson and Courier Cars

THERE ARE THREE GOOD REASONS why you should have your car overhauled now and worn parts replaced.

FIRST: The garage man can give you better service—and you can spare the car better now than later. No matter whether you are going to keep the car, or sell or trade it in on a new one—it will pay you well to have it thoroughly overhauled, worn parts replaced by new ones and body repainted.

SECOND: We are able to furnish replacement parts for all models of above makes of cars within 48 hours from receipt of order. Have concentrated this branch of the business at Newcastle, Ind. (center of population of the U. S.). Here we have a \$1,750,000 investment in plant and stock. 45,000 separate bins of parts.

THIRD: And perhaps the best reason why you should secure your requirements now—we must increase prices 20% January 1st, when the new parts price lists will be off the presses.

NOW NOTE THIS—Never before in the history of this industry has a new concern, having bought the plants and assets of a bankrupt one, taken upon itself the obligation of furnishing replacement parts for the cars it never made.

Write for our booklet, "How to Make Your Car Live Twice As Long," in which we set forth the Maxwell policy toward owners of the above mentioned cars.

THE MAXWELL MOTOR COMPANY DID. We considered it good business, even if not a moral or legal obligation.

WE FOUND 122,000 owners out in the cold, as it were—pleading for parts. Their cars laid up and useless in most cases.

WE'VE INVESTED about one and three-quarter millions (\$1,750,000) dollars in a plant and stock of parts, for over 150 different models, made by the concerns that comprise the United States Motor Company, whose assets we purchased from the Receiver thru the U. S. Courts.

WE TOOK THE NAME MAXWELL solely for the protection of 60,000 persons who had bought cars under that name.

HAD WE CHOSEN ANOTHER NAME those 60,000 cars would have had almost no value in the second-hand market. As it is, they have a definite value. And by the replacement of the worn parts your car will be good for a long time to come.

ANY RECOGNIZED DEALER or repair man—whether he handles the present Maxwell line or not—can procure these parts for you. Or you can order direct. Shipment will be made within 24 to 48 hours after receipt of the order at Newcastle.

## Maxwell Motor Co., Inc.

Address Dept C, Detroit, Mich.

Note: For quicker service those living East of the Alleghenies can order from Maxwell Motor New York Co., 13th and East Ave., Long Island City. From the Alleghenies to the Rockies, order direct from Maxwell Motor Newcastle Co., Newcastle, Ind. West of the Rockies, order from Maxwell Motor Sales Corporation, 675 Golden Gate Ave., San Francisco.

*When Writing to Advertisers, Please Mention Motor Age.*



## The Specialization of These World-Famous Factories Makes United States Tires Supreme

The conclusive proof that United States Tires are sweeping all before them is in the actual number in use, the ever-increasing demand and the consistent re-orders.

These famous tires contain the best that the greatest engineering skill and brains can give them—the best materials that experience and money can buy.

The unsurpassed and famous policy of four tremendous factories working as a unit has established in the tire world the expression for mileage,—

*"As Good as United States Tires."*

*In the history of the motor vehicle no one industrial move has meant so much to the true lovers of the automobile. As one instance,—witness the birth of those "Aristocrats of the Road"—the "Nobby Tread" and "Chain Tread"*

They are today the accepted standard for tire wear—the acknowledged goal of all competition—the criterion in the tire world of the fulfillment of the ideal manufacturing policy.

When you purchase United States Tires you are sure of these vitally important facts:

1. Of the organization behind these famous tires.
2. Of vast experience in tire building.
3. Of a tremendous company that actually backs up its tires and has real service branches.

### Real United States Tire Company Service Branches in the Leading Cities

Atlanta, Ga. .... 21 Houston St.	Denver, Colo. .... 215-217 16th St.	Minneapolis, Minn. .... 1522-1524 Hennepin Ave.	Salt Lake City, Utah. .... 132 E. 2d So. St.
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Boston, Mass. .... 560 Commonwealth Ave.	Fresno, Cal. .... Masonic Temple Bldg.	New York, N. Y. .... Broadway at 58th St.	Savannah, Ga. .... 307 Bull St.
Buffalo, N. Y. .... 733 Main St.	Grand Rapids, Mich. .... 17 Library St.	Philadelphia, Pa. .... 329-331 N. Broad St.	Seattle, Wash. .... 212-216 Jackson St.
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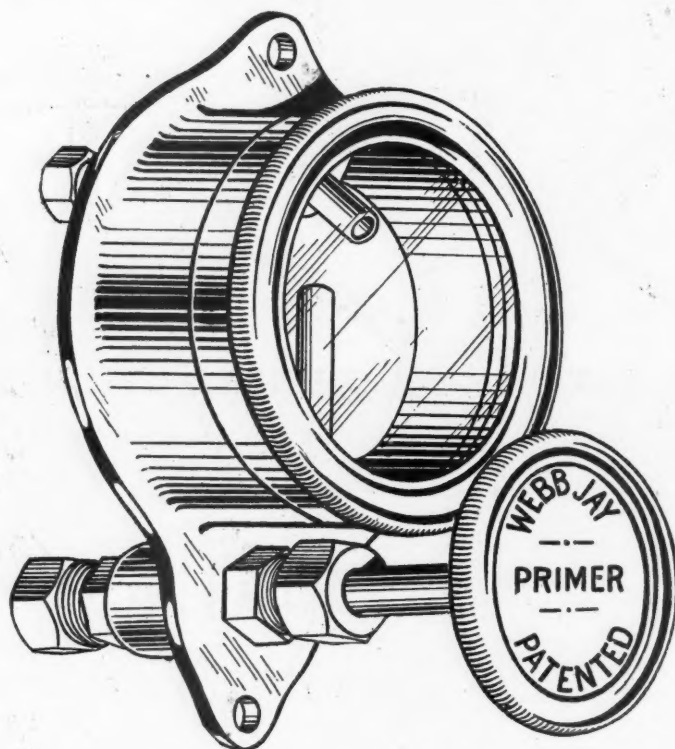
# United States Tires

Made by the

## Largest Rubber Company in the World

*When Writing to Advertisers, Please Mention Motor Age.*





## It Insures Your Motor Starting Instantly

Wouldn't it be worth a lot more than \$6.00 to be rid of all that starting trouble you are having this cold weather? \$6.00 is all it costs to get—

# The Webb Jay Automatic Suction Primer

This primer will relieve you of hard starting trouble for the life of your car. It insures your motor starting instantly.

It saves time, temper and a lot of hard cranking. You lose that "cuss-the-car" feeling the first time you operate it. It makes motoring in winter as care-free as in summer.

With this primer attached it no longer becomes necessary to keep your motor running should you wish to let your car stand for a few minutes.

**Try one! If it doesn't end your hard starting troubles, we'll refund your money**

**Price, Complete, \$6.00**

Handled by all first class jobbers and dealers, or can be ordered direct from the manufacturers by using the coupon.

*SOME CHOICE TERRITORY STILL OPEN TO AGENTS*

**The Motor Devices Company**

Manufacturers of the Webb Jay Automatic Suction Primer

**2635 Wabash Ave.,**

**Chicago, Ill.**

*The Motor Devices Company, 2635 Wabash Ave., Chicago, Ill.  
Gentlemen: Enclosed please find (check money order)  
for \$6.00 for which please send me one Webb Jay Automatic Suction Primer.*

Name.....  
Address.....

*When Writing to Advertisers, Please Mention Motor Age.*



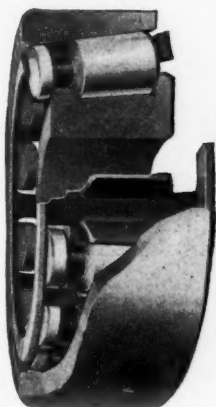
## As Your Car Grows Old, Keep it Tuned Up

Retain its smoothness, its quietness and comfort. Retain its quick response, its effective power—its dependability. You bought it for these qualities—keep them in the car as it grows old in your service.

Tune up your motor, adjust the carburetor for weather and varying qualities of gasoline. Adjust the steering gear. Adjust the brakes.

*And don't forget to adjust the bearings.* For all bearings wear same as other moving parts and need adjustment if you are to keep the full power and efficiency of your car.

### Inside Knowledge that will Help You



Timken Bearing partly cut away to show construction



If wear occurs, leaving slight space between cup and roller, adjustments can be made by moving the cup or cone in the direction of the arrows.

As 1-2 and 3-4 always remain exactly parallel, the adjustment brings the different surfaces into perfect line-contact, and no principle of the bearing's efficiency is impaired.

WHEEL bearings must turn easily of course—to eliminate friction. But they must fit snugly too—to prevent wheels from wobbling.

As bearings wear—all bearings do—they get loose. A little looseness allows the pound that makes faster and faster wear—more and more looseness.

Bearings on shafts that support gears—transmission, driving and differential gears—when they wear (as all bearings do) allow the shafts to drop slightly out of line. The gears on those shafts get slightly out of correct mesh. Imperfectly meshed gears make noise and waste some of the power.

The trouble goes on at an increasing rate unless promptly checked by adjusting a type of bearing that can take up looseness when it develops.

Use of steels best adapted for bearings, extreme accuracy of manufacture, strict following of heat-treatment formulas developed by years devoted to concentrated study of bearings alone—these are producing bearing parts that have wonderful wear-resisting qualities.

And yet bearings—all bearings—do wear.

The Timken Tapered Roller Bearing is the one type of bearing that can be adjusted to completely eliminate the effects of its slight wear.

The Timken Tapered Roller Bearing carries the load and resists the shocks along the lines of its rollers instead of on the points of balls; its tapered construction enables it to meet side pressure and shocks in addition to direct load; its line contact distributes pressure and hence minimizes wear—these are three great principles that are kept in constant operation for your benefit by the fourth great principle of adjustability.

And beyond keeping the Timken Bearing itself always at full efficiency its great principle of adjustability keeps the shafts and gears up to their top notch efficiency.

You can see how important it is to have adjustable bearings in your car if you are to retain its effectiveness as a power vehicle—as it grows old in your service.

Other interesting facts about bearings are told in the Timken Primer No. T-1 "On the Care and Character of Bearings" which, with the Timken Primer No. T-2 "On the Anatomy of Automobile Axles," will be sent free, post-paid on request to either Timken Company.

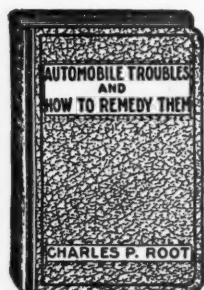


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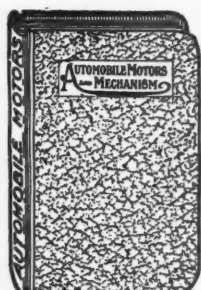
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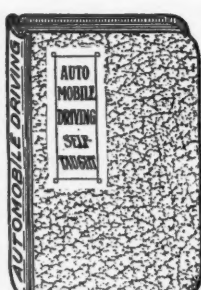
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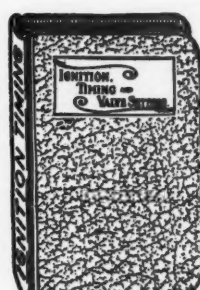
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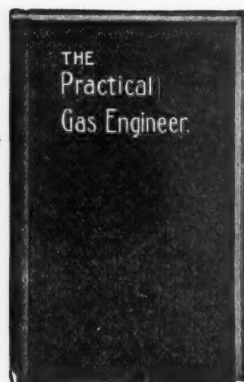
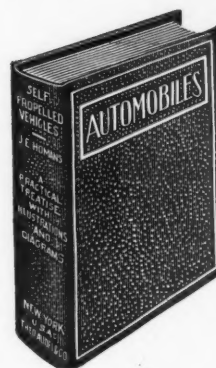


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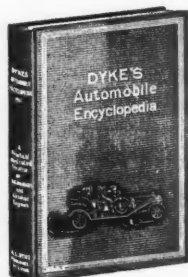


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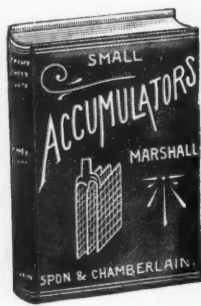
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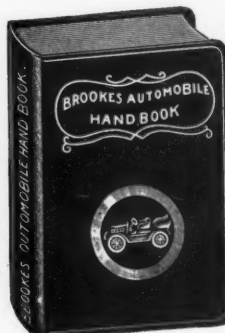
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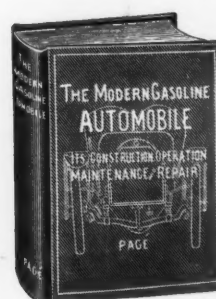
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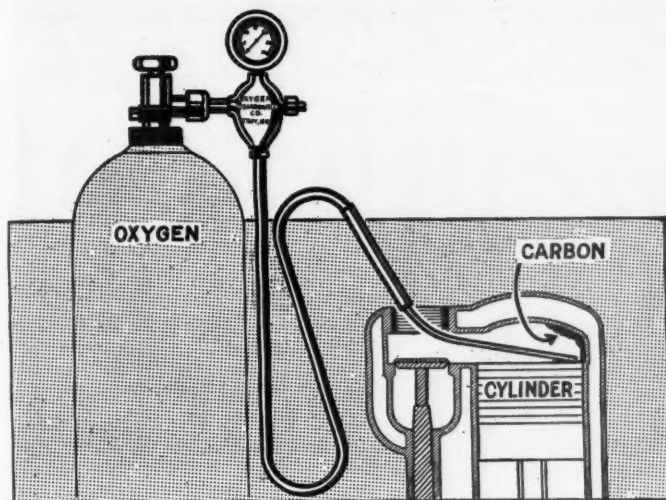
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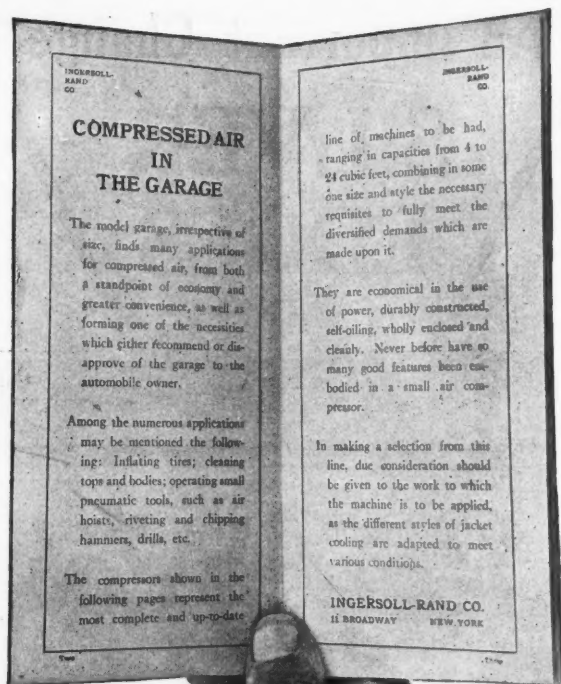
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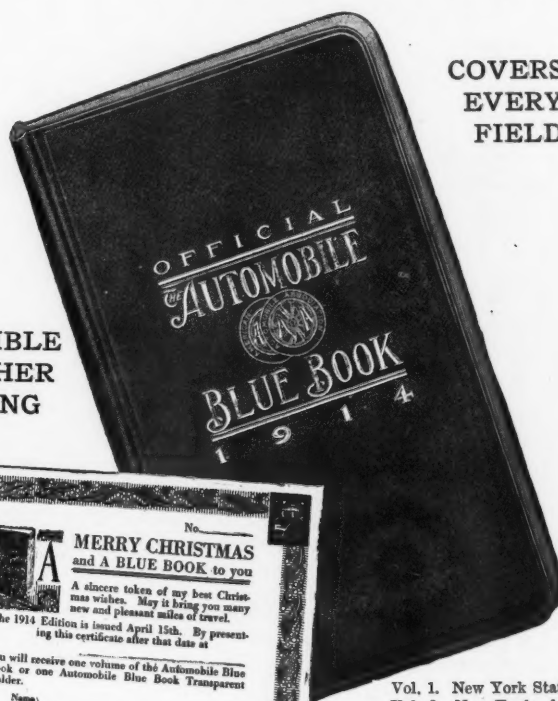
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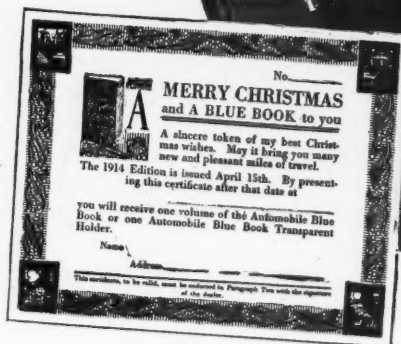


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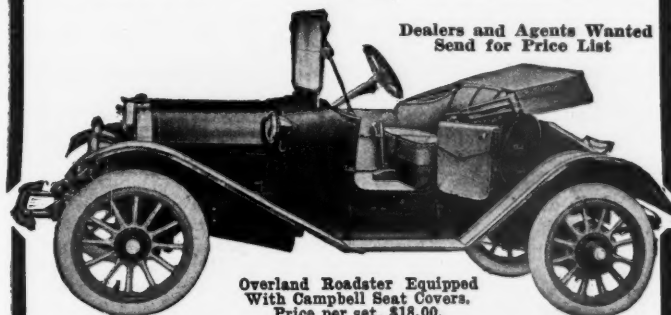
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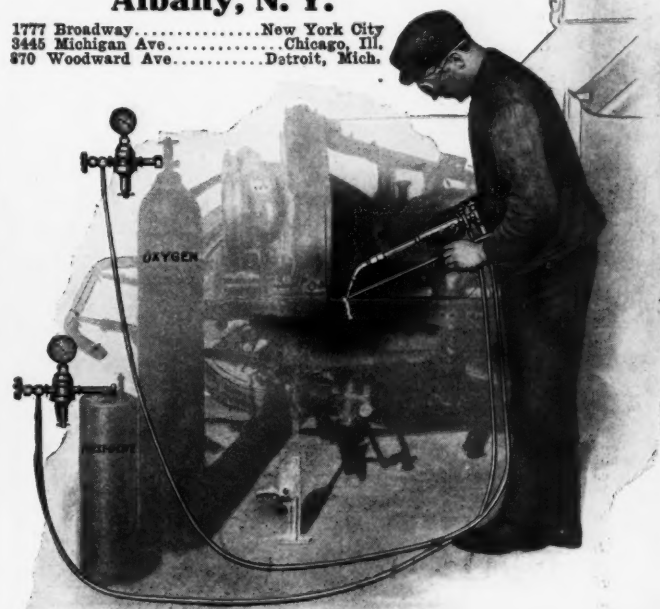
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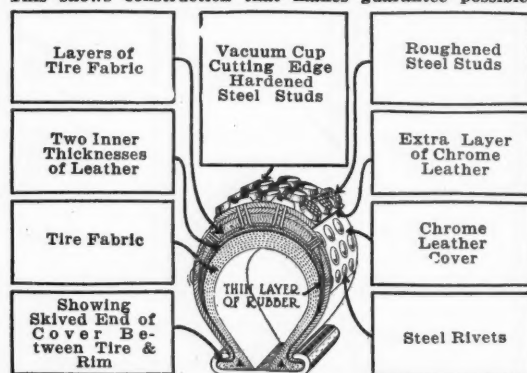




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**BEFORE WE PLACE AN AGENCY WE WANT** a set of these Brictonson Tires in each town—who will be the first one to order?

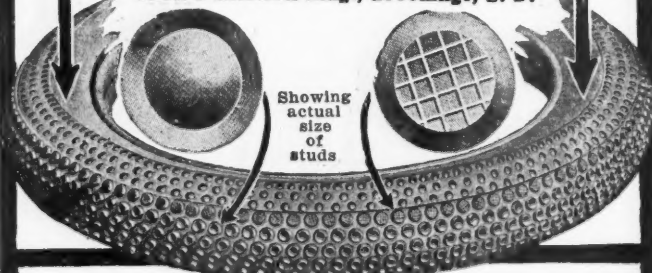
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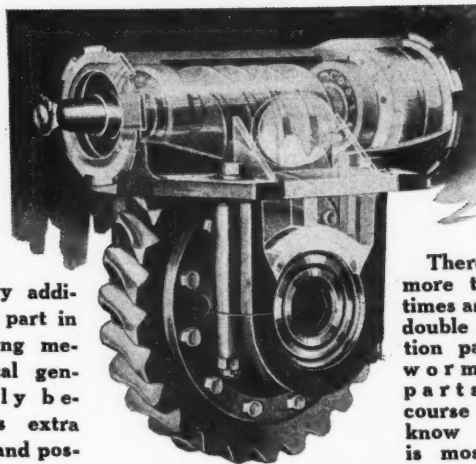
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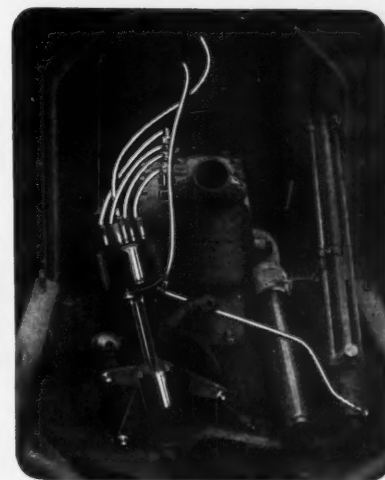
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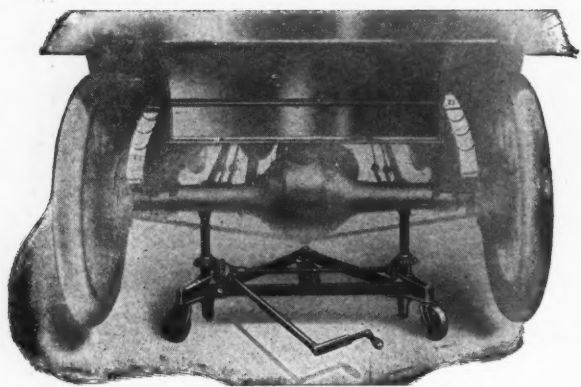
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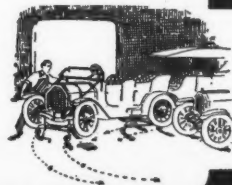
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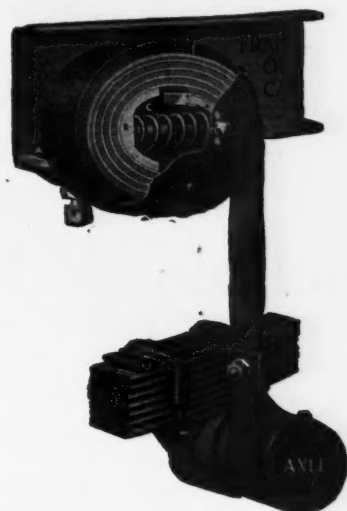
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Easiest to apply. Merely clamp coil to frame and secure belting around axle. Nothing to work loose, rattle or wear out. No future readjustment required. Snubbers allow the springs to work naturally on the closing movement, but retard abrupt or excessive expansion; prevent the snappy rebound that jars mechanism and passengers; put a stop to excessive up and down movement of springs.

**GABRIEL HORN MFG. CO., 1415 E. 40th St., Cleveland, Ohio**

Makers of GABRIEL Musical Horns and Windshield Cleaners

**MARATHON SELF-SELLER**  
**106 WHEELBASE**

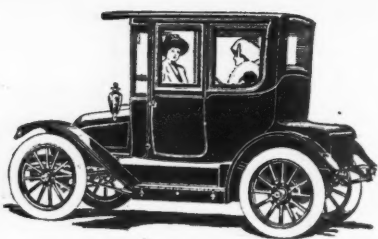
**\$1095**  
**25 H. P.**

COMPLETELY  
EQUIPPED  
ELECTRIC  
LIGHTED  
AND  
STARTED

This  
**MARATHON**  
is a wonder  
from a quick-

selling standpoint—the best dealer proposition in the automobile field today. The biggest looking car for its size and a *star* performer. It has been named the “*Runner*” on account of its smooth, easy, graceful glide and its impression of reserve power. It is as nobby as any car you know and as remarkable in service as the Marathon “*Winner*,” which has them all guessing. Six dependable models in the Marathon line. Some territory still open. Better wire or write today.

**HERFF-BROOKS CORPORATION, Indianapolis, Ind.**



## Buffalo Electrics

*"The car you always admire"*

**S**ERVING a distinct need, Buffalo Electrics stand alone as the town car. Their claim to the place they occupy is based upon exclusive features—three point motor suspension—direct drive—noiseless running and the wonderfully simple foot control.

That's only a few points. Our catalogue explains others. Send us your name—today.

Special inducements in localities where we are not represented.

**BUFFALO ELECTRIC VEHICLE COMPANY**  
Successors to Babcock Electric Carriage Co.  
1219 Main Street Buffalo, N. Y.

## Every Automobile and Garage Owner or Operator

should possess a reliable, durable, convenient Electrical Measuring Instrument



WESTON MODEL 280  
Portable Testing Instrument

## Weston Miniature Precision Ammeters and Voltmeters

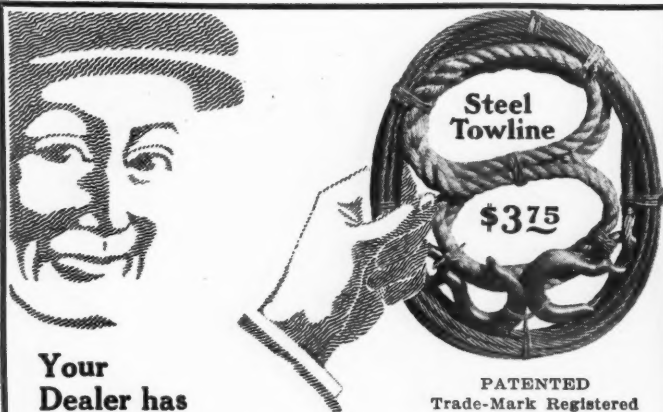
**FIT THE POCKET**

and are in every way the most accurate, durable, reliable and altogether satisfactory for testing batteries and electrical circuits.

Send for 30-page bulletin No. 8 describing these and other small instruments.

**Weston Electrical Instrument Co.**  
NEWARK, N. J.

New York	Boston	Denver	Birmingham	Montreal
Philadelphia	San Francisco	Cleveland	Toronto	Paris
Chicago	St. Louis	Detroit	London	Berlin



Your  
Dealer has

## Basline Autowline \$3.75

or he will get you one at once. Then you can tow or be towed when road trouble occurs, as it will sooner or later.

### Coils Up Flat Under a Cushion

Basline Autowline takes up no room in a car, as bulky manila rope does. It weighs only 5 pounds. But the wonderful Yellow Strand wire rope gives it strength to pull a big car out of a ditch—or all the way home. It's 25 feet long and can be attached for towing easily, quickly. Has stood every test for past two years. Get Autowline from your dealer today! What's \$3.75 compared with security, safety, motoring satisfaction?

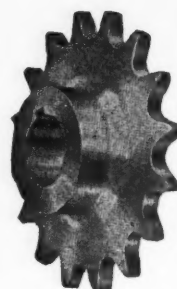
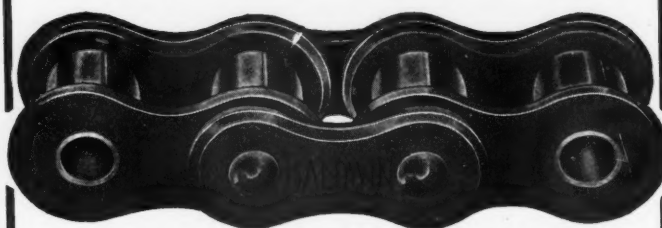
**FREE**—Write for the fully illustrated Autowline circular

*The Little Steel Rope with the Big Pull*

**BRODERICK & BASCOM ROPE CO.**

813 N. 2nd Street St. Louis, Mo.  
New York Office, 76 E. Warren St.  
Manufacturers of famous YELLOW STRAND WIRE ROPE

## BALDWIN Chains and Sprockets



run well together; made in a completely equipped plant with an organization skilled in the art by long experience. Manufacturers should have samples and prices of our chains, and allow us to quote on their blue prints for sprockets before placing their 1914 orders. We are prepared to furnish sprockets for replacements for all standard and commercial cars.

H. V. GREENWOOD, 122 So. Michigan Blvd., Chicago, Ill.; C. J. IVEN, Rochester, N. Y.; M. A. BRYTE, 788 Mission St., San Francisco, Cal.; C. D. SCHMIDT, 416 Broadway, New York City; F. SHIRLEY BOYD, 893 Boylston St., Boston, Mass.



## Have You Bought a New FORD CAR?

"No, This Is My Last Year's Model  
—I painted It Myself with

### Hanline's Ideal Paint Package"

You can do it, too! The package contains everything necessary to do a good job. There are fourteen different articles—goods that have been tested and tried, and we guarantee them.

HANLINE'S IDEAL PACKAGE contains enough paint, stain, dressing and polish to make a FORD CAR new. It will also do the same for any car of similar size.

Motor Car Equipment Co. .... N. Y., N. J. & New England  
Gibson Automobile Co. .... Indianapolis, Ind.  
Automobile Equipment Co. .... Detroit, Mich.  
Chicago Automobile Supply Co. .... Chicago, Ill.  
Gibney Motor Supply Co. .... Philadelphia, Pa.

Retail Price, \$6.50

JOBBERS WANTED FOR STATES NOT COVERED

Retail Price, \$6.50

**HANLINE BROS., Paint Manufacturers, BALTIMORE, MD.**

Do the painting yourself any evening. It takes only a few hours. By morning the car is as dry as toast—and looks exactly like new. Then you'll be as proud of it as the very day you first drove it down the street.

HANLINE'S IDEAL PACKAGE can be obtained at any FORD accessory store or the following distributors:

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R. W. Norris & Sons. .... Baltimore, Md.  
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STANDARD FOR 59 YEARS  
1855 ————— 1914

## Jones Wheels

*"Best on Earth"*

*A broad statement, but we stand by it.*

THE NAME OF JONES  
AS APPLIED TO  
WHEELS MEANS THE—

**First—Last and  
All-the-Time Word  
In Wheels**

*"Kantsamore"*

Buyers of Vehicles should say—  
"Give me wheels made by

**Phineas Jones & Company**  
Newark, New Jersey, U. S. A.

Starts — Lights — Ignites

# REMY

Six Volt System—Does-It-All

THERE is only one real way to provide for the efficient starting, lighting and ignition of your car.

Have one manufacturer design and build all three systems; have this one manufacturer responsible for all three.

We are the only concern building the complete apparatus—either as a whole or in any combination—starter—lighting equipment—magneto, or battery ignition (generator and storage battery). The starting and lighting equipment is sold only to automobile manufacturers.

Write for our magneto exchange offer.

**Remy Electric Company**

General Offices and Works, Anderson, Indiana

BRANCHES:

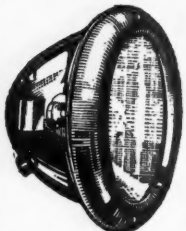
New York    Detroit    Kansas City    Minneapolis  
Boston    Chicago    San Francisco  
(Service stations throughout the country)



## Simple, Efficient and Economical

The  
**K-W Electric Headlight Outfit, \$40**  
Complete Outfit: Generator, Head Lamp, Switch, Wire and Bulb

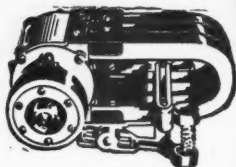
Easy to Install. Mount in Any Position



Runs in Either Direction

Has Only  
One Moving  
Part

No  
Commutator  
or Brushes



Gives 2,1600 C. P. Headlights

Send for Descriptive Folder P. We Also Make a

**K-W Ford Electric Headlight Outfit, \$15**  
FOR FORD CARS WITH FLYWHEEL MAGNETO  
and the famous K-W Master Vibrator  
The Standard by Which All Others Are Judged

**THE K-W IGNITION CO.**  
2835 Chester Avenue CLEVELAND, OHIO, U.S.A.

# Veeder

## "A Detail of Perfection"

is positively necessary in any instrument used to keep tabs on cost of upkeep. Tires, gasoline or "juice," and lubrication cost can only be correctly ascertained with the VEEDER HUB ODOMETER—a perfected instrument that can't be fooled with.

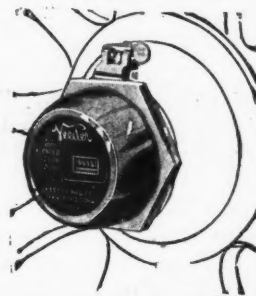
Neat, durable and compact, it can be easily attached. Price complete,

**\$25.00**

At your dealer's, direct from our factory, or at the following agencies:

T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

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**The Veeder Manufacturing Company**  
O. H. VEEDER, President D. J. POST, Treasurer  
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HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings

## Splitdorf "Ford Special" Waterproof High Tension Magneto

is a magneto *you* can apply to *your* Ford car, and it will give the motor the response and flexibility of the highest priced automobiles.

A SPLITDORF "Ford Special" magneto increases motor efficiency 33 1/3 per cent, saves its cost in less gasoline consumption, assures constant electric lighting and is installed easily, quickly and inexpensively.

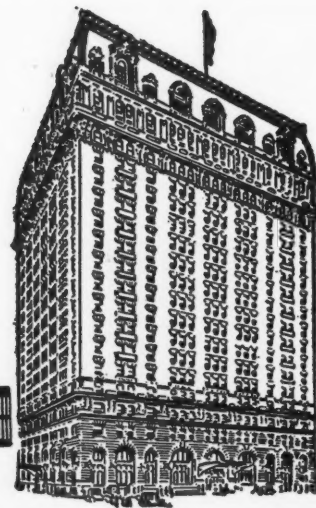
Write to Nearest  
Branch House for Details

## SPLITDORF ELECTRICAL CO.

Atlanta, 10-12 E. Harris St.  
Boston, 180-182 Mass. Ave.  
Chicago, 64-72 E. 14th St.  
Detroit, 972 Woodward Ave.  
Kansas City, 1823 Grand Ave.  
Los Angeles, 1226 S. Olive St.

Newark, 290 Halsey St.  
New York, 18-20 W. 63rd St.  
Philadelphia, 210-12 N. 13th St.  
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## Hotel La Salle

CHICAGO'S FINEST HOTEL

ERNEST J. STEVENS, Vice-Pres. and Mgr.

Located in the heart of the city, within easy reach of all railway terminals

### RATES

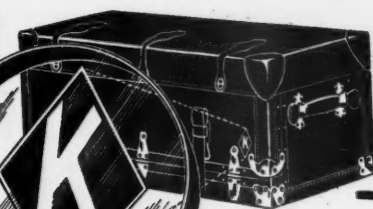
ONE PERSON	Room with detached bath.....\$2 to \$3 per day
	Room with private bath.....\$3 to \$5 per day
TWO PERSONS	Room with detached bath.....\$3 to \$5 per day
	Room with private bath.....\$5 to \$8 per day

### TWO CONNECTING ROOMS WITH BATH

Two persons .....	\$5 to \$8 per day
Four persons .....	\$8 to \$15 per day
SUITES .....	\$10 to \$35 per day

LA SALLE AT MADISON STREET, CHICAGO

WHEN YOU BUY  
AN  
AUTO  
TRUNK



Look for  
the Red  
' and Gold "Diamond  
on the Front

The red and gold trade-mark shows that it's a genuine Kamlee—the handsomest, strongest, most convenient auto trunk ever made.

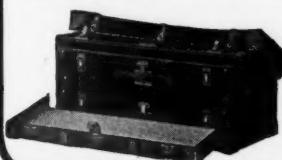
Light and flexible, yet tough and durable in the extreme, it fulfills every requirement of the touring motorist. New air-tight interlocking edge makes

## THE NEW KAMLEE

*The Only Really Dust-Proof  
and Rain-Proof Auto Trunk*

on the market. The edges lock together—rain or dust cannot enter anywhere. A rubber tubing at bottom of interlocking groove conforms to any irregularity or give in top and front. Contents thoroughly protected in any weather. Waterproof covering is fastened

over top with patent spring-swivel nuts. No straps to bother with in opening. See it at your dealer's or write us for prices and descriptive booklet. We'll gladly send you a Kamlee on approval anywhere if your dealer can't supply you.



THE KAMLEE COMPANY  
234 Broadway Milwaukee, Wis.

## DUELEC

to intake manifold

### As Necessary as Spark Plugs

One turn and off she goes. Hot, vaporized gasoline right into the intake manifold.

Better than a dozen ordinary primers combined.

Saves your starter (if you have one) \$50 worth of wear and tear a season. Absolutely insures immediate starting on crank in any temperature.

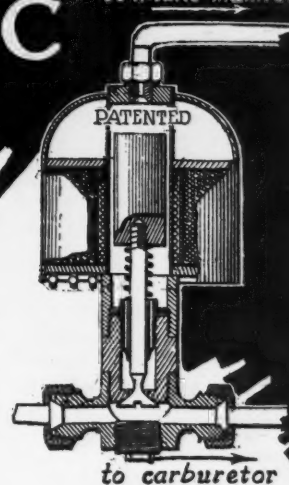
Sure to be universally used. Works automatically with your starter, or when cranking.

MR. MOTORIST—Demand it from your dealer. Or sent upon receipt of \$10.00.

DEALERS—This is one big sales proposition for you to investigate.

To the Manufacturer—Be a leader and include the DUELEC as part of your standard equipment.

This device is as important for starting as oil is for the engine—takes only an hour to install. Write for information and make checks to



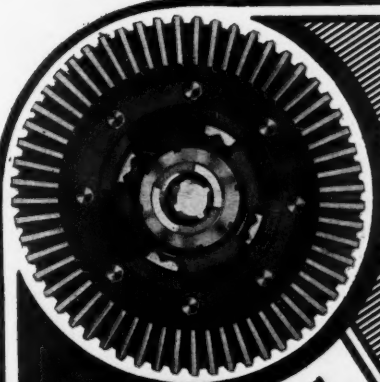
to carburetor

**U. S. TRAUB**

14 North Broadway,

Yonkers, N. Y.

47M




"Warner Gears—  
Standard for Years"

Transmissions  
Steering gears  
Differentials  
Control levers  
Clutches

*Recognized Standard*

**The Warner Gear Co.**  
of  
**Muncie Ind.**

DETROIT OFFICE ~ 628 FORD BLDG.



King Winter  
cuts no ice, if your  
radiator contains

**THERMITE**  
"The great anti-freeze"


Diluted one half, it  
prevents freezing at  
twenty below zero.

Price \$1.25  
At any up-to-date supply house.

THE NORTHWESTERN  
CHEMICAL CO.  
Marietta, Ohio.

Makers of  
**SE-MENT-OL**

**THERMITE**  
THE NEW ANTI-FREEZE





## Springs of Cross-Rolled Steel Cut Up-Keep

In this new process, the steel is worked both longitudinally and transversely. So we get superior strength and toughness. We use this process exclusively in our Chrome-Vanadium Brand of Springs.

Find out more about them. It will make a tremendous difference in the riding qualities of your car.

Best Grade—Chrome-Vanadium  
Next Best—Special Analysis

The Cleveland-Canton Spring Co., Canton, Ohio, U.S.A.



In five years not one Cleveland - Canton Chrome - Vanadium spring returned because of breakage or settling.

Let us send you full particulars

Use **POLO** Pneumatic  
Rim Cutting  
Entirely Done  
Away  
With



Bored from  
solid brass

## Tire Alarm

Heavily Nickeled

Thoroughly Tested  
and Guaranteed

Easily and quickly attached to valve stem, they take the place of the cap. Compactly made and reduced to the smallest possible size compatible with strength and durability.

Prevents Rim Cutting  
Lessens Blow-Outs and Blisters

Running on low air pressure shortens the life of a tire more than any other cause. The Polo Pneumatic Alarm advises you instantly when the pressure falls below a given point, by giving vent to a shrill whistle. We invite inquiries from dealers and auto users.

Write for descriptive folder

**POLO PNEUMATIC ALARM MFG. CO.**  
CLEAR LAKE, SO. DAK

## Cut Gears of Quality Complete Differentials

**NEW PROCESS  
GEAR CORPORATION**  
SYRACUSE, N.Y.

## Own the Vulcanizer you're paying for.

Yes, paying for it in repair bills and tire service that you don't get. You buy two tires where one would do as well.

**SHALER  
Vulcanizer**

Mends tubes and casings perfectly. You or your chauffeur can use it. Prices \$2 and up.

One free copy of "Care and Repair of Tires" if you write at once. Tells what you need to know about tire-saving devices.



C. A. SHALER CO., 248 FOURTH ST., WAUPUN, WIS.

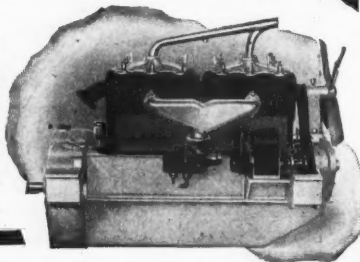
## Wisconsin Motors

### ROAD CHAMPION OF AMERICA

The Tacoma, Santa Monica, Elgin and Corona road races were won hands down by Stutz cars equipped with the consistent Wisconsin Motor—the drivers never raising the hood. Winning all these big road events of the year has accorded Wisconsin Motors the title of Road Champion of America. Write for catalog describing the following sizes:

3 1/2" x 5"	4 cyl.....	Enbloc
4" x 5"	4 cyl.....	Enbloc
4 1/4" x 5"	4 cyl.....	T Head
4 3/4" x 5 1/2"	4 cyl.....	T Head
5 1/4" x 7"	4 cyl.....	T Head
5 3/4" x 5 1/2"	6 cyl.....	Enbloc
4" x 5"	6 cyl.....	S Enbloc
4 1/4" x 5"	6 cyl.....	T Head
5 1/4" x 7"	6 cyl.....	T Head

**Wisconsin Motor Mfg. Co.**  
Dept. 25 Milwaukee, Wis.



## FINISHED CRANK SHAFTS COMPLETE CONNECTING RODS COLD DRAWN STEEL SHAFTING

Screw Stock, Flats, Squares,  
Hexagons and Special Shapes

FINISHED MACHINE KEYS - MACHINE RACK

All material finished to a  
superior degree of accuracy

**STANDARD GAUGE STEEL CO.**  
BEAVER FALLS, PA.

## Pullman "Little Six"

*The Only Genuine Streamline Motor  
Car Built In This Country*

This epoch making automobile with  
**VULCAN ELECTRIC GEAR SHIFT  
& WIRE WHEELS** priced at only \$2400.

Fours and Sixes—\$1775 to \$2850

Write or Wire

**PULLMAN MOTOR CAR COMPANY, York, Pa.**

## KINGSTON CARBURETOR

### Save Money by Economizing Gasoline


Four floating bronze ball valves opening automatically under different motor suction supply a uniform mixture at any speed, regardless of hot, cold, wet or dry weather.

Write for details and let us tell you why so many manufacturers are adopting this carburetor as standard equipment

Made by the oldest manufacturers of carburetors in America  
ESTABLISHED 1895

**BYRNE, KINGSTON & COMPANY, Kokomo, Ind.**





## STAPLEY TIRE PUMP

Made by Bridgeport Brass Co.

### Increases the Life of Tires

The STAPLEY makes it easy to keep tires properly inflated. It is an efficient Compound pump of the finest materials and workmanship; it is always ready and always works.

Price without Gauge \$4.00      With Gauge 6.00

THE BRIDGEPORT BRASS COMPANY  
P. O. Station A      Bridgeport, Conn.




S. R. O.  
Ball Bearing

*Mea* Magneto

Sole Importers

## MARBURG BROTHERS, Inc.

1790 Broadway, New York

Detroit      Toronto      Chicago

# PAIGE

Model "36" \$1275.00

A car whose design and construction is so far ahead of others at its price that it is in a class all its own.

Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

Model "25" \$975.00

Including Electric Starting and Lighting System

This model has made the Paige reputation. Such a sturdy, powerful, comfortable car has never been offered the public at anywhere near its price. \$975.00 with complete equipment.

Splendid Agency Proposition

Paige-Detroit Motor Car Co., 304 Twenty-First St., Detroit, Mich.



## No More Tire Trouble!

That's what car owners all say who use Interlock Inner Tires. Increase the pleasure of motoring and get rid of the constant fear of tire trouble by using Interlocks.

Send For Free Book

that describes Interlock Inner Tires and gives valuable tire facts and testimonials of tire experts and Interlock users.

DOUBLE FABRIC TIRE CO.,  
128 W. 9th Street,  
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# GOOD YEAR

AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (978)

THE GOODYEAR TIRE & RUBBER CO.  
AKRON, OHIO

## SIXTH YEAR

# McFARLAN SIX

The only medium priced six that is not a new untried model

### Better Than The Price

## \$2590

McFARLAN MOTOR COMPANY      Connersville, Indiana

# PREMIER

AMERICA'S  
GREATEST TOURING CAR



PREMIER MOTOR MFG. CO.  
INDIANAPOLIS, INDIANA

# JESCO

TRADE MARK

## ELECTRIC STARTING & LIGHTING

ASSURES 100% EFFICIENCY



JONES ELECTRIC STARTER CO.  
ADAMS & LOOMIS STS. CHICAGO, ILL.

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop

## TWITCHELL AIR GAUGE

and save your tires.



"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

For sale by Jobbers, Dealers, Garages, or

The Twitchell Gauge Co.

1201 Michigan Avenue

Chicago, Illinois

Better Specify

# BOSCH

For 1914 and Be Satisfied

—99 Service Stations—

If you want ignition information or advice, write to us  
BOSCH MAGNETO CO., 214 W. 46th St., New York

## AUTOMOBILE



## SPRINGS

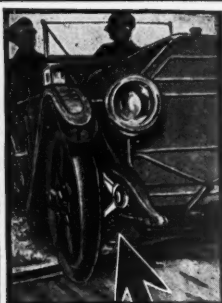
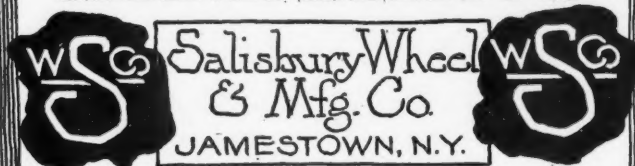
THE PERFECTION SPRING CO.

Cleveland

Ohio

## SALISBURY

AXLES WHEELS  
TRANSMISSIONS



### Shock Preventer

A scientific, mechanical triumph.  
NOT FRICTION, but graduated  
resistance of rubber discs accord-  
ing to road conditions. Made in  
sizes to fit any car.

They are being rapidly adopted  
by car builders as standard equip-  
ment and by car buyers everywhere. Ask us to prove this.

If you are interested in eliminating bouncing and saving tire  
and repair bills, write today for Booklet "N"

The Aristos Co., 250 W. 54th St., N.Y. Send for Free Sample  
Mondex Polish

### This Hanger FREE

Write also for  
our new folder

"Packard Cable—

How it is Made and Why  
it is Best," with liberal proposi-  
tion to dealers.

We want every  
dealer to have a  
16x20 six color repro-  
duction of the Pack-  
ard Girl by Liebscher

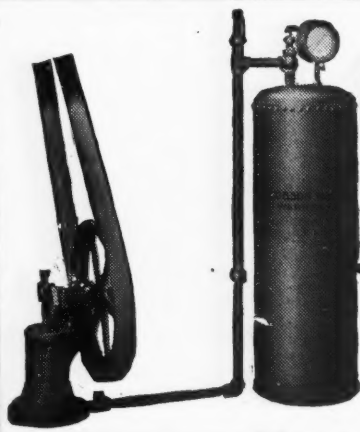


The Packard Electric Co.

Dept. C

(58)

Warren, Ohio



## Air Compressors

For  
Private and Public  
Garages

Single and Double  
Cylinders  
Air and Water  
Cooled Types

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HASTINGS & ANDERSON CO.  
Chicago, Illinois

Western Representatives

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"32" Touring car, fully equipped.....	\$1050
"32" Roadster, fully equipped.....	1050
"32" Touring car or Roadster with Westinghouse two-unit electric generator and starter; electric lights; over-size tires, 33x4 inches; demountable rims, extra tire carrier at rear .....	1200
"32" 6 passenger touring car, fully equipped.....	1200
With same options as above.....	1300
Coupe.....	\$1350
Delivery Wagon.....	\$1075

All prices F. O. B. Detroit

HUPP MOTOR CAR COMPANY

1228 Milwaukee Avenue

Detroit, Mich.

## American Axles

Found only  
on high  
grade cars

THE AMERICAN BALL-BEARING CO.,  
Cleveland, Ohio

## Marmon "Thirty-Two"

Four-cylinder, 32-40 h. p., 120-inch wheel base, body types and equipment to meet every requirement.

A rational, logical car for touring and city use. Years of satisfactory service have proved its economy in tires, fuel and upkeep — plus smooth, delightful operation and durability.

Price, \$3,000.

**"The Easiest Riding Car In The World"**  
**MARMON**  
Nordyke & Marmon Company  
INDIANAPOLIS  
Sixty Years of Successful Manufacturing  
(Established 1885)  
Six-cylinder, 48-80 h. p., 145-inch wheel base with short turning ability, eliminating the old objections to long wheel base. Body types and equipment to meet every requirement. The only big car with small car advantages. Wonderful riding qualities and surpassing power and flexibility. A car developed by years of exacting tests. Price, \$5,000.

## Marmon "Forty-Eight"



"The right  
way to  
light the  
way"

You'll bring your motor car up-to-date quickly and inexpensively by installing

## Apelco Electric Lights

It's an electric lighting system that is dependable and reliable, has a light that will penetrate fog and dust as well as darkness. You can get a full description of this lighting system by writing to

THE APPLE ELECTRIC COMPANY  
67 Canal St. Dayton, Ohio

## UNIVERSAL JOINTS "SPICER" MEANS QUALITY

"SPICER" on universal joints means quality, and "SPICER" quality has been a standard ever since universal joints have been manufactured.

Let us quote you prices on your requirements

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Domestic Representatives: K. Franklin Peterson, 122 So. Michigan Blvd., Chicago. Thos. J. Wetzel, 17 West 42nd St., New York. L. D. Bolten, 2215 Dime Savings Bank Bldg., Detroit. Foreign Representative: Benjamin Whitaker, 21 State St., New York.

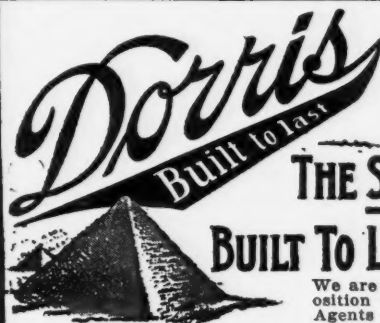
## AJAX

## Mileage Contest

\$5000 in Cash Prizes

For full particulars address

**AJAX-GRIEB RUBBER CO.**  
1796 BROADWAY, NEW YORK

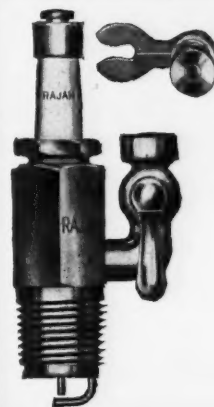


## THE SILENT CAR

**BUILT TO LAST** Attention, Agents!!

We are offering a big, liberal proposition and unusual sales help to Agents on the

**1914 Dorris Truck & Pleasure Car**  
We sell "through" the dealer and not "to" him. Write today.  
**DORRIS MOTOR CAR COMPANY** St. Louis, Mo.



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Priming cup soldered in firmly to prevent leaking.

Material and workmanship of the highest grade—fully up to the standard set by us for over ten years.

Terminals as shown furnished with every Plug.

**\$1.50**

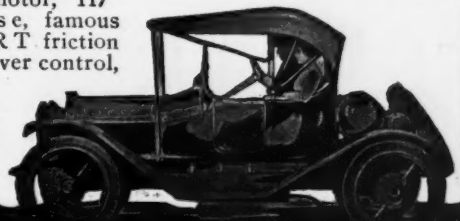
**RAJAH AUTO SUPPLY COMPANY**  
Bloomfield, N. J.  
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The LAMBERT Model 99 (5-passenger touring car or 2-passenger roadster) at \$1365 (fully equipped) stands at the head of its price class. It comprises 4 1/2 x 5 1/4

Rutenber motor, 117" wheelbase, famous LAMBERT friction drive, one lever control, etc. Write for catalog.

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GAS, OIL, AND ELECTRIC  
CORCORAN LAMP CO.  
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## HAYWOOD STEAM VULCANIZERS

THE PROFIT MAKING PLANTS



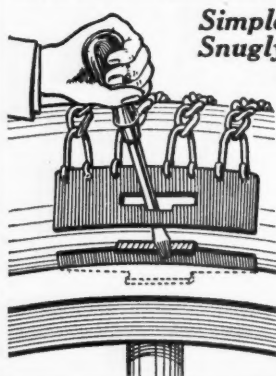
The vulcanizing system that DOES NOT use air bags. SOLID PADS and HEAVY CLAMPS are the means through which pressure is generated.

Plants from \$25 to \$500

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Simple and Easy to Install. Fits Snugly on a Level with the Tread

Gives you thousands of extra mileage

3 1/2 inch.....	\$2.00
4 inch.....	2.25
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Sent postpaid to any part of the United States

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Universal Valves

For sale by Tire Mfrs., Jobbers and Dealers or  
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Backed by 15 years of specialization. Found on more high-grade cars than all other makes of lamps.

A Solar Lamp for every motor need.

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### Complete Line of Commercial Vehicles

All type bodies—special bodies designed. Unexcelled for service, efficiency and economy. KisselKar Trucks have great reserve power. Low fuel cost; sizes to give more economical service under all conditions.

1500 lbs. 1, 1 1/2, 2 1/2, 3 1/2 and 6 Tons

KisselKar Service Buildings at principal points throughout the U. S. are equipped to give an unusual service to owners of KisselKar Trucks. Let us analyze your haulage problem and show you how to make a big saving.

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with the best gears known, lubricated with ordinary grease, showed actual wear on gear teeth in 1,000 miles. The same type of

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have established the standard of electric car construction for all time to come.

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Model T Runabout.....\$500  
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 With Full Equipment f. o. b. Detroit

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**HERZ PLUG**  
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**BEST ON EARTH**

BLUE  
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*Gearless!*  
*Not even a clutch!*  
*The simplest car made—*  
*unlimited speeds—one lever*  
*control—climbs steep hills.*  
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RADIAL RETAINERS

Manufacturers of Radial Ball Retainers, Thrust  
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No straps or com-  
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Type 35  
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Electric  
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The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

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**Faultless Lighting  
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**Prepare for Cold Weather and Forestall Cranking and Starting Troubles.**

How often have you wished for something—anything, in fact—that would help you start your car in the cold weather. The improved Michener gasoline saver and primer is the very thing you are looking for. I positively guarantee my device to start any car in the coldest weather, and to save from 25% to 40% on your gasoline bills. If it does not, you get your money back for the asking.

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Please Note:—  
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**Strong Features:**

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Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Rear Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car

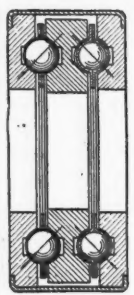
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**KEATON NON-SKID TREAD**  
has four times the wearing service of the ordinary non-skid. Users will tell you that they have run Swinehart Keaton Non-Skid Tread Tires a whole season without having them lose their anti-skid effectiveness. Call at any one of our stores and investigate them. We also make a complete line of Smooth Pneumatic Tires of best quality. Branches and distributing agencies in all leading cities.

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The arrows on the cross section show how the load is evenly carried by upper as well as lower balls, making the only perfectly balanced radial bearing, and at the same time an ideal thrust bearing. This Double Row Ball Bearing will carry a greater load than any other ball bearing.

Races made from solid, special analysis steel. Specially selected alloy steel balls. Maximum size and greatest number of balls. Greatest bearing surface between race and balls. Closest limits of guaranteed accuracy.

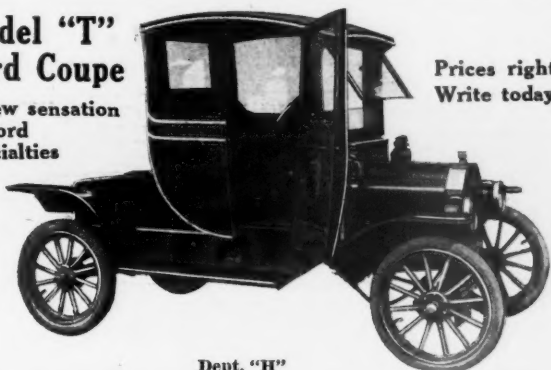
Now used in motor cars, machinery, and to equip our Special Shaft Hangers. We also make plain and grooved thrust bearings.

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A new sensation  
in Ford  
Specialties



Prices right  
Write today

Dept. "H"

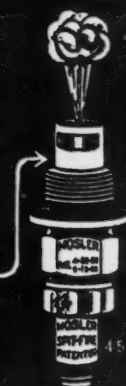
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FOR 13 YEARS HAVE BEEN LIKE THIS

INSIST ON OUR  
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## We Specialize in High-grade Automobile Parts

Transmissions  
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The Warner Manufacturing Co.  
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## THE RUTENBER MOTOR

MANUFACTURED SINCE 1901 FOR HIGH GRADE  
AUTOMOBILES AND TRUCKS

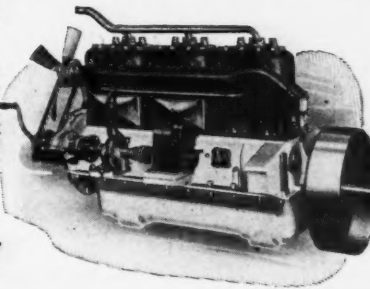
3 1/2 x 5 1/2 four and six cyl.  
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Standard or Unit

and  
4 x 4, 4 1/2 x 5 and 4 1/2 x 5  
Standard Types. All L  
Head 4 Cycle.

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to investigate our service  
and our facilities. Literature  
on request.

The Rutenber  
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**SKID  
BLOWOUTS  
RIMCUTS  
PUNCTURES  
WEARING OFF  
OF RUBBER  
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Each section 2 in.  
wide. They hook to  
rims. Try two or  
three sections over  
any old blowout.

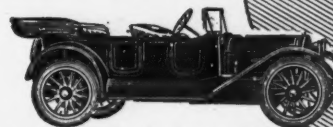
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KIMBALL TIRE CASE CO., 173 BDW., COUNCIL BLUFFS, IA.

The 6-Cylinder, Reasonably Priced

## deSotofix 55 H.P.

The car with a stronger appeal than any  
recent product of the trade—the one that  
meets a popular demand. We have an un-  
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Write at once for free catalog and full  
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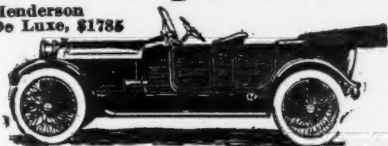
Sells for  
\$2,185



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Henderson  
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We have some inter-  
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Selling some cars, you  
may sell large numbers  
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business shows a loss.

Through merchandizing strategy we have remedied these flaws.  
May we tell you about these things and about our kerosene-burning  
car, equipped with wire wheels, cowl dash, cowl gasoline tank. Left  
drive, center seat control—the most salable car offered today.

Wire or write for the facts

Henderson Motor Car Co.  
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50¢

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### Spark Plug

**50c. IS ENOUGH**  
The "Black Eagle" Spark Plug marks the dawn of a new era. From now on The Price of Spark Plugs will gravitate to Fifty Cents.

**Why not be a pioneer in your territory?**  
The reason is apparent—none better at any price. Made in all standard threads mailed upon receipt of price.

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It Is a Great Deal Better to Use



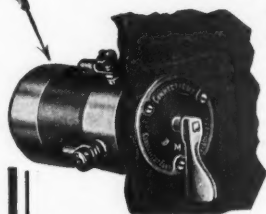
TRADE MARK  
**NON-FLUB OIL**  
REGISTERED IN  
UNITED STATES  
BUREAU OF OILS

because your car is NEW, than to have to do so because your car is prematurely OLD.

N. Y. & N. J. Lubricant Co., 165 Bdw'y., N. Y.  
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### Master Vibrator For Ford Cars



A dependable master vibrator at a reasonable price. Makes starting easy—motoring becomes a pleasure.

Flush Type—Price...\$9.00

Delivered upon receipt of price  
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Are unexcelled for long mileage and endurance. Ask any user.

Send for price list and full particulars

Established Agents Solicited

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Bull Dog  
Non-Skid

### "THE TUGBOAT OF LAND COMMERCE"

SOLVES THE  
HEAVY TRUCKING  
PROBLEM



MARTIN  
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**Herreshoff** Electric Self-Cranking  
Electrically Lighted  
Four Forward Speeds

The Herreshoff six was the first light six built and is today conceded the best example of skillful design in combining strength with reduced weight.

"Six-Forty" Touring Car and Roadster \$1850 - 7 Passenger \$1900

Model 4 - 30 Touring Car - \$1350

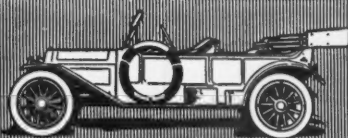
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**HERRESHOFF MOTOR CO.,** Detroit, Mich., U.S.A.

The  
Thoroughbred  
Car



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INSURANCE FOR  
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**RHINELAND MACHINE WORKS CO.**  
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### The New Jones Speedometer Unaffected by Heat or Cold


You want absolute accuracy in speed readings just as you want the right time from your watch. There is one way to get it—get a New Jones.

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, tests and experiments that show Jones supremacy beyond question. Then specify what speedometer you want on your car this spring.

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KRUPP AUTOMOBILE CRANK SHAFTS, STEEL FORGINGS AND FRAME MEMBERS,  
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**USE**  **STEEL**

Call for Krupp Steel In Your Car and  
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KRUPP STEEL LOCOMOTIVE TIRES AND CAR WHEEL TIRES, CRANK SHAFTS, STEEL  
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All the facts on  
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**Manufacturers of 1914 Models** Don't omit a SPARKS-WITHINGTON Fan from your 1914 specifications. Our One-Piece blade, ball-bearing, radiator fan assemblies cool the motors of more high-class cars than any other fan on the market. There's a reason. SPARKS-WITHINGTON Fans deliver the greatest volume of air with the least H. P. consumption of any fan obtainable. Furthermore, their one-piece construction is positive insurance against blades which loosen, become detached and fly off. Undoubtedly one of our ten standard models is just what you have been looking for. Catalogue and detailed blue-prints on request. Get in touch with us.

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JACKSON MICHIGAN - WALKERVILLE CAN.



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Could see us build the Cable-Structur Tire—see how slowly and carefully our tire builders work—see what quality we put into Cable-Structur—see the letters we have from satisfied dealers and users, you wouldn't delay one minute in writing us for the exclusive agency in your city.

Come to our factory and see all these things with your own eyes. The evidence for Cable-Structur service and satisfaction is unanimous. Write today for our proposition.

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Six Cylinder, 65 H. P.  
Equipped with Vulcan  
Electric Gear Shift.

Four Cylinder, 40 H. P.  
Equipped with Vulcan  
Electric Gear Shift.


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Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that as a Haynes dealer you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

*May we tell you why we believe this?*

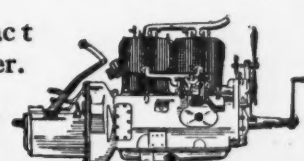
**THE HAYNES AUTOMOBILE CO., 2 Main St., Kokomo, Ind.**



**Ergon Motors are "work" motors. Their Simplicity of design assures long life and ample power.**


We never over contract our ability to deliver.

Three models. Model C, 3 3/4 x 4 1/2; model CX, 4 x 4 1/2; model D, 4 3/8 x 6.



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The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

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*Fitted With HOUK Quick  
Detachable Rims*

Make for greater resiliency, smoother riding. Save tires. Are quickly and easily removed. Practically indestructible. Absolutely rust-proof. Now being manufactured in America by the Standard Roller Bearing Company, of Philadelphia.

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**SIMPLY AUTOLIFTED  
ON TELESCOPIC LIFTER**

Raises or lowers top in one minute.

(Record operation, 60 seconds.)

Lifter handles one side, you the other.

Top can't slip—Bow can't break.

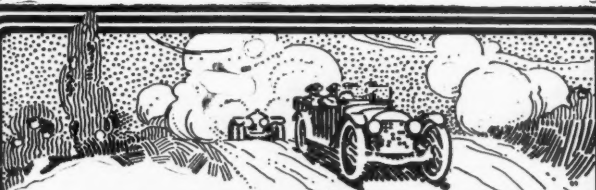
Simple—Strong—Necessary.

Dealers—They sell as fast as you can demonstrate. Write.

**Simplex Specialties Co.**

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More power - Less fuel - Wider range

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## The Standardized Car

*The car that started the  
stampede  
to standardization*

A Cole franchise is a valuable asset to any dealer. Find out about it.



**Cole Motor Car Co. of Indianapolis**



**TIRE-LIFE**

Keeps out LIGHT and OIL and will add to the appearance of your car and the life of your casings. Easily applied, not sticky.

Quarts .75 cents. Gallons \$2.75  
Write for special dealers proposition.

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**"THE CAR  
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**Three Great Models—** Pilot 50—4 cylinder, 4 1/2 x 6—59 H. P.—120 inch wheelbase, roadster and touring car—\$2250. Pilot 50—roadster—4, 6, and 7 passenger bodies, 126 inch wheelbase—\$2500. Pilot 60—6 cylinder, 4x6, brake test 67 H.P., 132 inch wheelbase, roadster, 4, 6, and 7 passenger touring cars—\$2785.

### THE CAR WITHOUT A MECHANICAL DEFECT

Teetor "T" Head Motors, full floating rear axles, Brown-Lipe differential, Warner transmission. Elsemann Magneto. Carter Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

**PILOT CAR SALES COMPANY**

Richmond, Indiana

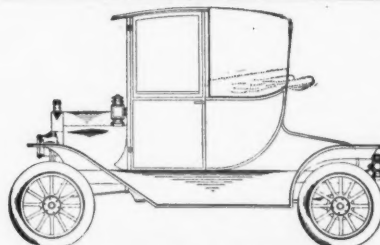
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REG. U.S. PAT. OFFICE

**MAGNETO PLUG**

Regular, \$1.00  
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Platinum Point, \$2.00

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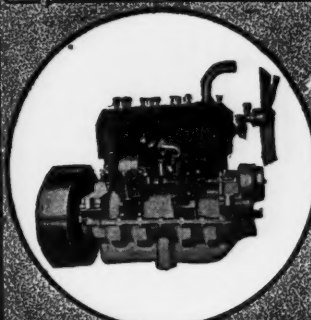
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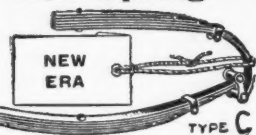
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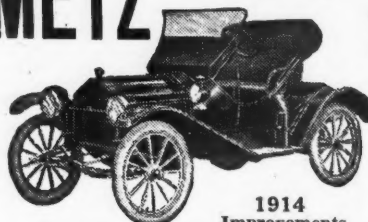
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Lamps, bodies, tops and everything for the automobile at a price listed on list of our 1,000 bargains.

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Makes all faded, stained and spotted linings a black uniform color. Makes old linings like new. Ask your dealer.

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The Detroit Radiator is guaranteed to give satisfaction. It insures perfect cooling, won't break through freezing, and is the strongest and best radiator for replacement purposes.

## Stock Radiators.

Ford T (special construction).....	\$20.00
Ford T (honeycomb with larger cooling area).....	30.00
Buick 10-32-33.....	26.00
Buick 16-17-19-26-27.....	31.00
Buick 24-25.....	35.00
Overland.....	30.00
Chalmers 30-40.....	30.00
Hudson 20.....	30.00

Prompt delivery on special radiators.

DETROIT RADIATOR & SPECIALTY CO.,  
963 Woodward Ave.,  
Detroit, Mich.

## PEERLESS MOHAIR TOP DRESSING

Waterproofs leaking tops and makes old tops like new. Sold by garages, dealers and jobbers.

THE COLUMBUS VARNISH CO.,  
Columbus, O.

## RADIATOR COVERS

Full stock for all cars

Prompt shipment

Ford covers, \$1.40; other cars, \$2.50.  
Allen S. Sinsheimer  
1505 Michigan Ave., Chicago

## RADIATORS—NEW GUARANTEED GOODS

Ford, Model T.....	\$16
Buick, Model 10.....	22
Buick, Model F.....	25
Chalmers-Detroit.....	20
Everett.....	20
Stoddard-Dayton.....	25

Any other make required at equally low prices.

The Times Square Automobile Co.,  
1210-1212 Michigan Ave., Chicago.

## RADIATORS.

Every radiator guaranteed absolutely new, not a reconstructed one.

In stock for immediate shipment.

Ford Model "T".....	\$18.00
Buick 10-14.....	27.50
Buick F-16-17-19-26-27-28.....	35.00
Hudson 20.....	33.00
Chalmers F-40.....	30.00
Hupp 32.....	25.00
E-M-F 30.....	30.00
Anhut.....	15.00
Northern C.....	32.00
Wayne 30.....	35.00
Special 40 H. P.....	15.00

5% discount allowed for cash with order, otherwise one-third cash with order, balance C. O. D.

We also have all repairs for the Wayne, Queen and Northern cars.

## AUTOPARTS MANUFACTURING COMPANY

453 Trombly Avenue, Detroit, Mich.

## RADIATORS.

Stoddard-Dayton, any Model.....	\$20.00
Brush Runabout.....	10.00

## SUPPLIES AND PARTS

Do you want our Ford or Regular Catalogue? They are yours for the asking.

THE M. & M. COMPANY  
500 Prospect Ave., Cleveland, Ohio.

RIMS, RINGS AND RIM PARTS FOR ALL rims made. Send for our rim part catalogue.

KASTNER TIRE AND RIM CO.,  
2112 Michigan Ave.,  
Chicago, Ill.

## SAVE GASOLINE—PREVENT BACK-FIRE.

An absolute necessity to every owner. Economizes fuel, saves from 25 to 50% on your gas bill. 100% efficiency guaranteed. Don't delay, write us at once. This device sells for \$5.00. Thirty days' trial; if not as represented, money refunded.

GAS SAVING & BACK-FIRE PREVENTER CO.,  
125 E. 23rd St., New York, N. Y.

## \$ SAVE YOUR DOLLARS \$

BY THE USE OF AMERICAN GASOLINE SAVER, YOU CAN SAVE 30% ON YOUR GAS BILL, increase the speed, start car easier. Guaranteed as represented. Price only \$5.00, special price to jobbers and dealers. Representatives wanted. Send for prices today. MONEY BACK IF YOU WANT IT.

AMERICAN RUBBER PRODUCTS CO.,  
24 So. Clinton St., Chicago, Ill.

## "SAVE YOUR GASOLINE."

We have 150 Rayfield carburetors, regular \$20.00 kind. Our price, \$8.20 while they last. PURITAN MACHINE CO.,  
415 Lafayette Blvd., Detroit, Mich.

SCHUBLER MODEL "L" CARBURETORS, new, 1½-inch, \$8.00 each. Order early. Kent Motor Car Co., Kenosha, Wis.

## SHINAUTO—THE GREAT PRESERVER.

Keeps auto like new without washing. Prevents cracking and checking of varnish. Makes old cars like new. Guaranteed. Saves paint bills. Trial can, 50c by mail. Enough for two months' treatment.

SHINAUTO MFG. CO., INC.,  
1137-1139 No. Illinois St., Indianapolis, Ind.

## SPECIAL BARGAINS

Rutenber motors, 4 cylinder model 27, 3¼x5¼, brand new with magneto attached; fan, starting crank, etc. Price, \$225.00.

Fore door bodies, six and seven passenger, painted, ironed for top, untrimmed, \$25.00. Fore door bodies, ironed for top, untrimmed, \$20.00.

BEARINGS. No. 316 Hess Bright, R. I. V., New Departure and S. R. B., \$9.50 each; No. 219 D. W. F., 95 A-F & S, and 1219 S. K. F., \$8.50 each; No. 314 S. R. B., 15 B-R. I. V., \$7.50 each; No. 411 D. W. F., 9 C-R. I. V., 55 C-F & S., 411 S. R. B., 1411 New Departure, \$6.75 each. Other sizes also on hand.

Automobile Appliance Co.,  
1712 Michigan Ave. Chicago, Illinois.

STOP THAT LEAK IN YOUR RADIATOR with one ounce of Overton's Radiator Leak Compound. A pound can by parcel post for 35c cash. N. L. Overton, 1109 4th Ave., Council Bluffs, Iowa.

## THAT MYSTERIOUS RAG

For dusting and polishing automobile bodies, windshields, lamps, pianos or any other polished surface. Will sell on sight, good proposition for garages. Sent to any address upon receipt of 50c.

THE GEM SUPPLY,  
1036 So. Main St., Waterbury, Conn.

THOMAS FLYER CHASSIS, SEVEN-PASSENGER top, body tires, one extra tire and rim lamps, everything complete, in fine condition, without engine, \$300, or sell parts separate. Parish Boat Co., Dayton, Ky.

TOPS BUILT, RECOVERED AND REPAIRED. Also Top Covers, Radiator Covers, Luggage Cases, Celluloid, etc. C. G. Meyer & Son, Tiffin, Ohio.

## SPECIAL MOTOR SALE.

Four cylinder truck motor, cast en-	
bloc, 35 H. P., new.....	\$100.00
Six cylinder Herschell-Spillman 1914	
motor, new.....	275.00
Four cylinder 35 H. P. Northway type	
motor, new.....	130.00
Four cylinder Mitchell motor, cylinders	
cast in pairs, complete with mag-	
neto, oiling device, water pump and	
carburetor.....	145.00
Four cylinder 30 H. P. Beaver motor.....	80.00
Four cylinder Oswald T-head motor.....	100.00
Two cylinder opposed Davis water-	
cooled new motor.....	80.00
Two cylinder opposed Sears motor,	
slightly used.....	40.00
Four cylinder Halladay motor, new.....	135.00

Timken bearings nearly all sizes for	
Midland cars.....	Each 1.50
New Departure bearings No. 305.....	Each 1.50
New Departure bearings No. 407.....	Each 1.50
Hyatt Bearings.....	Each .75

SEND FOR LIST ON OTHER SIZES IN BEARINGS.

Midland fenders.....	Each 2.00
Black enameled fenders suitable for	
most any car set of 4.....	8.00
Detweiler steering gears.....	Each 15.00
Rushmore brass generators.....	Each 3.00
Searchlight gas tanks.....	Each 10.00
Cone clutch leathers.....	Each 1.00
Split-fire spark plugs ½" or ¾", conical	
type.....	Each .30

## AUTO PARTS CO.

737-739 Jackson Blvd.

Chicago, Ill.

TOPS, NEW OR RECOVERED; CUSHIONS and Backs, new or recovered; Carpet Rugs; Curtains; Dust Covers, etc. W. H. Newton & Son, 120 Elm St., Cortland, N. Y.

TOURING ROADSTER, RACING BODIES. Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,  
1534 Michigan Ave., Chicago.

## TRUCK BODY FOR SALE

A fine panel body, made for 1½-ton Rapid truck, cost \$400 to build, no reasonable offer refused. Clover Farm Co., Worcester, Mass.

TRUFFAULT-HARTFORD SHOCK ABSORBERS: \$45.00 kind; \$20.00 set of four. PURITAN MACHINE CO.,  
417 Lafayette Blvd., Detroit, Mich.

## UNION OXY CARBIDE CO.

Manufacturers of Portable (weight 40 lbs.) and stationary welding, cutting or lighting plants; supplies of all kinds. Agents wanted. Fulton & Enfield Sts., Brooklyn, N. Y.

WELDING PLANT, CUTTING PLANT, Carbon Removing Outfit, or a combination of all of these at from \$75.00 to \$175.00 for high or low pressure system. For full particulars address Bermo Welding Apparatus Co., Omaha, Neb.

WE MAKE FORD RACING TYPE BODIES in several models for immediate delivery.

Auto Sheet Metal Works,  
1532 Michigan Ave., Chicago, Ill.

WESTON MOTT HIGH GRADE REAR axles, \$45.00. Other bargains, too. PURITAN MACHINE CO.,  
413 Lafayette Blvd., Detroit, Mich.

15 BRAND NEW TRUCK RADIATORS with hoods, \$14.50 each. Have also lot of new ¾" front and ¾" and 2" rear truck axles. Slightly used 34x3¼" and 36x3¼" truck wheels with solid tires; 18" diameter steering wheel with ratchet, levers, post, knuckles, etc.; 11¼ ft. truck frame. Logan sliding gear transmission with jack shaft sprocket and chain for 1½ to 2 ton truck. Badger Motor Co., Milwaukee, Wis.



## TRUSTEE SALE BY AUCTION.

By order of the United States District Court for the Western District of Michigan, Southern Division, we will commence selling on TUESDAY, DECEMBER 9th at 10:30 A. M. at Kalamazoo, Michigan, AT PUBLIC AUCTION, all assets belonging to the

Estate of

MICHIGAN BUGGY COMPANY;

also

MICHIGAN MOTOR CAR CO.,

Manufacturers of Michigan "40" car and

KALAMAZOO BLANKET MILLS.

## INVENTORY VALUE OVER \$1,000,000.

On the first day we will offer for sale all the REAL ESTATE belonging to the bankrupt concern, after which we will offer for sale the right, title and interest of Trustee in

## GOOD WILL,

which consists of the right to use the name, franchise, trade names, orders on hand, incoming orders, etc., etc., together with all jigs, templates, patterns, blue prints, etc.

Included in the sale of the good will, will be the SERVICE DEPARTMENT, which is a large item, as there are upward of 6,000 cars in the hands of owners and the demand for parts and repairs is very good. The entire sale is expected to take a week's time.

The following automobile parts and accessories will be offered for sale:

- 100 Sandusky 4-Cylinder Motors.
- 500 Lewis 56-inch Axle Sets.
- 100 Buda 4-Cylinder Motors.
- 50 Lewis 60-inch Axle Sets.
- 500 New Frames.
- 10 Barnes Transmissions.
- 200 Prest-O-Lite Tanks.
- 50 Complete Differentials.
- 400 Goodyear and Goodrich Tires and Casings 34x4 1/2.
- 800 Castle Dinner Headlights.
- 200 Electric Horns.
- 200 Briggs 4-Cylinder Magnetos.
- 1,000 Briggs 4-Cylinder Coils.
- 1,500 Firestone 34x4-inch Rims.
- 5,000 Ft. of Conductor Duplex, Battery Cut-out Looms and Self-Starter Wire and Cable.
- 100 Willard 6-volt Storage Batteries.
- 100 Wind Shields.
- 1,000 Tungsten Bulbs from 2 to 16 c. p.
- 1,000 Pairs Wheels.
- 1,000 Auto Bodies, finished and partly finished.
- 1,000 Pressed Steel Fans, complete.
- 250 Gemmer Steering Gears.
- 300 Bevel Ring Gears.
- 7,000 Hyatt and New Departure Ball Bearings.

(Continued in next column.)

## TRUSTEE SALE BY AUCTION

- 2,000 Gr. Hex. Nuts, Cap Screws, nickel, blue and brass screws, stove bolts, castellated nuts, semi-finished nuts, carriage and stud bolts, axle nuts, washers, machine screws, etc.
- 50,000 Lbs. Oval Tongue Door Mouldings.
- 300 Ton Sheet Steel 16 to 24 gauge.
- 3,000 Keller Hood Clamps and Toggle Locks.
- 3,000 Champion Spark Plugs.
- 500 Complete Tool Kits.
- 1,000 Triumph Jacks.
- 200 Sets Tire Chains.
- 200 Vesta Generators.
- 5,000 Lbs. Curled Hair.
- 150 Schebler and Stromberg Carburetors.
- 2,000 Sets Santa Bow Sockets.
- 6,000 Sheets Celluloid.
- 50,000 Yds. Shamer Webbing 1 1/4 to 5 in.
- 5,000 Yds. Velvet Carpet 27 to 30 inch.
- 10,000 Yds. Welt Leather.
- 150,000 Ft. of Fine Leather in Ottumwa brown, Lackawanna gray, Bridgeport black, Connet, Strouse, etc.
- 500 Perfection Fasteners.
- 1,200 Yds. Cook's Linoleum.
- 2,000 Pairs Auto Top Irons and Side Tire Holders.
- 3,000 Rear and Front Springs.
- 500 Complete Clutches.
- 2,000 New and second-hand Radiators.
- 100 Blood and Spear Propeller Shafts.
- 2,000 pair Door Locks and Hinges.
- 5,000 Pair Stanley Hinges.
- 20 Ton Sheet Aluminum, 17 Gauge.
- 2,500 Lbs. Solder.

An enormous stock of parts for the service and regular stock, covering accessories for all automobiles.

## 10 MICHIGAN FORTY CARS,

in touring, runabout and service wagons.

## MACHINERY,

consisting of Engine Lathes, Drill Presses, Shears, Grinders, Welders, Tripammers, etc. A complete line of Tinner's tools, Hub Boring Machines, Band and Rib Saws, Trimming Machines, and \$10,000 worth of standard small tools. Also 10,000 ft. of New and Second-Hand Belting, all sizes; over one million ft. of Lumber and great quantities of Paints and Oils.

ALL PERSONAL PROPERTY WILL BE SOLD IN LOTS OR PARCELS ONLY AND NOT IN BULK.

Circulars enumerating the other assets will be issued upon request made to the undersigned Auctioneers.

Detroit Trust Company, Trustee.

Michigan Buggy Co., Bankrupt.

Messrs. Warren, Cady and Ladd, Detroit, Michigan,

and

Messrs. Kleinharts, Knappen and Uhl,

Grand Rapids, Michigan, Attorneys for Trustee.

SAMUEL L. WINTERNITZ & COMPANY, Auctioneers,

79 W. Monroe St., Chicago, Ill.

WE NOW HAVE BUT A FEW 30-35 AND 35-40 H. P. motors ready for shipment. Complete with magneto, coil and clutch. F. E. Alford, Goshen, Ind.

**WINDSHIELD SOLUTION — KEEPS** shield transparent in rain, snow and sleet slide off readily maintaining good vision. A boon to night drivers. Instructions and formula 25c coin. V. A. Doty, Chicopee, Mass.

**1913 FORD ROADSTER BODY WITH TOP** and side curtains, \$35.00. 1913 Ford Touring Car Body with top and side curtains, \$60.00. MacInnis Bros., Toledo, Ohio.

**\$50.00 AIR COMPRESSORS, \$18.00;** Ford lighting outfits, \$2.90; Ford radiator and hood covers, \$2.75; Clamp on bumpers, \$2.95; Ford master vibrators, \$5.50, 6-80 storage batteries, \$9.50. Fred Allen Auto Supply Co., 1610 Michigan Ave., Chicago, Ill.

**7-PASSENGER BODY, TOP, AND WIND-** shield complete, new, for 1913 Chalmers "Six," \$350.00; 7-passenger body for 1910 Winton "Six," good shape, \$100.00; 1911 Cadillac 5-passenger, newly painted, fine shape, \$675.00. M. H. Wood & Co., Webb City, Mo.

Parts and Accessories  
WANTED

**WANTED — 1911-1914 FORD TOURING** Bodies with Tops. Quote cash price. Ford Rebuilding & Specialties Co., 110 West 5th St., Amarillo, Texas.

## Cycle Car Accessories

**AXLES FOR EXPERIMENTAL CYCLE** Cars. Front, with hubs, \$21; without hubs, \$15. Rear, with hubs, \$14. Blue print, 10c. De Cross Car Co., Cincinnati, Ohio.

## CYCLECAR MOTOR DESIGNS.

Experienced motor designer has complete detail drawings and patterns for 2 cylinder 12 H. P. air-cooled motor designed for cyclecar use, also model. This motor can be contracted out and built for less than \$30. Desire correspondence with interested parties. Anonymous replies rejected. Address Box D 563, c/o Motor Age.

## PARTS FOR CYCLE CAR.

Light 14 h. p. opposed air-cooled motor with timer, coil, oiler and carburetor, shopworn but in perfect condition, \$60.00. New planetary shaft drive transmission, \$18.00. Light shaft drive jack shaft and differential, \$15.00. Regal steering gear, \$7.00. E. E. Bush, 311 6th St., Parkersburg, W. Va.

PARTS FOR CYCLE CAR OR LIGHT  
RUNABOUT

High Grade Pressed Steel Hubs  
Steering Knuckles  
Springs

BRENNAN MOTOR MFG. CO.,  
103 Grape St., Syracuse, N. Y.

## Wearing Apparel

**FUR LINED OVERCOATS AT ONE-** fourth value. Manufacturers' samples. Gentlemen's imported black broadcloth overcoats, lined with finest Australian mink, large handsome Persian lamb collar. All sizes. Retail value \$120. While they last will be sacrificed for \$35 each. First come first served. You take no risk. Examine and try on before paying. Write today, stating size, enclosing express charges only and coat will be sent at once. E. Roberts, Room 7, 160 West 119th St., New York.

## Cars Wanted

**FOR SALE—FOUR BUSINESS LOTS IN** Balfour, N. D.; or will exchange for a good auto.

M. W. STUART,  
Rt. No. 2, Bergen, N. D.

## FIFTY CARS WANTED FOR CASH.

Have customers waiting; if you want to sell your car quick, consign it to us; no charge whatever; we get our profits over your net figure; it is your privilege to remove car at any time without notice; will send for your car free within 200 miles.

American Used Motor Car Co.,  
Brooklyn, N. Y.  
500 Bergen Street. Near Flatbush Ave.

**WILL LOAN YOU MONEY ON YOUR CAR** or sell same. American Storage Co., 5025 Wabash Ave., Chicago. Phone Midway 3233.

**160 ACRES, MONTRAILLE COUNTY, N. D.,** 3 miles from town; heavy soil; \$700 incumbrance. Will trade equity for good first-class automobile. Write H. J. Johnson, Oaks, N. D.

### For Sale or Exchange

**FIVE (5) LOTS IN OAK-GLEN, ILL.,** Cook Co. For Automobile; what kind have you?

J. J. Clementz,  
Villa Grove, Ill.

**ONE 20 H. P. WHITING ROADSTER, COM-**pletely equipped. Would like good motor cycle or turning lathe valued at \$200.00. Albany Auto Co., Albany, Wis.

**WILL EXCHANGE BRAND NEW MARINE** or stationary engine for oxy-acetylene welding plant or new automobile parts. F. E. Alford, Goshen, Ind.

### Situations Wanted

**ADVERTISER, MARRIED, WISHES CON-**nection with reliable concern as salesman or other position where ability can be shown. Have had 10 years' auto experience and am willing to go anywhere. Can talk, read and write several foreign languages. Address, Box 387, Oxford, Mass.

**ENGINEER WITH CONSIDERABLE EXPE-**rience in gasoline and electric trucks would consider a change. Address Box D-550, c/o Motor Age.

**POSITION WANTED AS MANAGER OF GA-**rage or automobile business. I am now filling such a position with one of the largest garages in the Central West, of which I am part owner and am making this change solely on account of desire to change location. If you want your business increased and put on a good sound, paying business basis, your correspondence is respectfully solicited. Will be in position to change location about Jan. 1st, 1914. For further information address Box D-566, c/o Motor Age.

**POSITION WANTED BY A LICENSED** chauffeur; can operate and repair any gasoline car; sober and reliable. Address Charles A. Breiner, Sciota, Ill.

**WANTED—POSITION BY WORKING** foreman, eighteen years' experience. The man to build up new garage or a run-down shop; temperate. Address Box D 567, c/o Motor Age.

**SUPERINTENDENT OF SERVICE DEPT.**

Who has recently severed his connections with one of the largest Automobile Mfg. Branch Houses in New York would like to connect with another Manufacturer in a similar capacity. Knows the trade thoroughly in New York, Long Island, Connecticut and New Jersey, as result of 13 years of experience, and can bring trade. Has been influential in the sale of many cars in territory mentioned. Any reliable house desiring services of such a man, address Box D 549, c/o Motor Age.

**WANTED—POSITION AS DRIVER FOR** private family or tourist. Have had 8 years' experience, four years in shop and four on road. Can run and repair any make car. Good habits. Can furnish best of references. Address Box D-564, c/o Motor Age. h

### Help Wanted

**HIGH GRADE AUTOMOBILE MEN—AP-**plicants and employers write us concerning available positions in every branch of the industry. Toledo Engineering Agency, Toledo, O.

**VULCANIZER WANTED—WANT GOOD** reliable man who thoroughly understands the business. Must be industrious and trustworthy. Frank D. Stoop, Kallispell, Mont.

**WANTED—LIVE FACTORY REPRESENT-**ative that can call upon automobile manufacturers to take on a new clutch. Patents allowed. Superior to any now in use. Positive Clutch Co., 1345 Rawson St., Chicago.

**\$65 TO \$150 MONTH PAID MEN AND** women in Government Jobs. Common education sufficient. Over 12,000 appointments coming. Write immediately for free list of positions. Franklin Institute, Dept. A-70, Rochester, N. Y.

### Wanted—Agents

**WANTED—AGENTS TO SELL JIFFY** Auto Curtains in unallotted territory. Address Hercules Rubber Co. (Jiffy Curtain Division), 2 Hudson St., New York.

**YOU CAN GREATLY INCREASE YOUR** income by representing our line of lighting systems; our MATCH LIGHTING LAMPS sell like wildfire both in town and rural districts. No experience required, profits large, exclusive territory to right parties. Don't delay writing for free catalogue and full information. Doud Lighting Co., 175-F No. Sangamon, Chicago.

### Agency Wanted

**WANTED—BY A LARGE MINNEAPOLIS** firm, Minnesota, North and South Dakota territory, for car selling between \$700 and \$850. Box D 543, c/o Motor Age.

### Business Opportunities

**AIR SPRING OR PNEUMATIC BUFFER** Patents for light and heavy cars are not offered for sale every day; however, I have two such patents and would like to make terms with a manufacturer looking for something of this kind to place on the market. M. P. Hayward, Quincy, Mass.

**CYCLECAR DESIGNER, WITH SUCCESS-**ful model, complete drawings and patterns including own design motor desires to connect with parties able to furnish or command capital to build cyclecars. Promoters, agents or anonymous replies not answered. Address Box D 569, c/o Motor Age.

**FOR SALE—AUTOMOBILE REPAIR SHOP** Equipment—\$550. Complete with desk, gas engine, lathe, drill press, full column emery head, hack saw machine, Buffalo forge outfit, Akron steam tube vulcanizer, chain hoist, shafting, and other machine tools required in an up-to-date garage. A snap if taken at once.

F. E. Chavannes,  
Des Moines, Iowa

**FOR SALE—GARAGE BUSINESS ESTAB-**lished three years. Town of 10,000. Only one competitor. Keeps four repairmen busy. Price, \$4,000.00. Includes complete shop equipment, tools, air compressor, emery wheels, drill press, brazing outfit, traveling crane, gasoline and oil storage systems, two five-passenger touring cars, one 1913 model. Have good reason for selling. This is a fine chance to start right. Inquire Box D 548, c/o Motor Age, for particulars.

**FOR SALE—ONLY GARAGE IN PROSPER-**ous town. Implement business in connection. Will sell one or both. Address Box D 571, c/o Motor Age.

**INVENTIONS EXAMINED, PATENT AND** Working Drawings made. Models developed and built. Free report as to patentability and cost for development of your invention. Address Inventions Dept. A, The Toledo Engineering Agency, Toledo, O.

**LOCATION WANTED IN MIDDLE WEST—**Factory of about 30,000 sq. ft. and more available; also to interest local capital to manufacture cycle cars. For further information address Box D-562, c/o Motor Age.

**WANTED.** A man to take an important position with a rapidly growing automobile manufacturing concern, who can invest \$25,000. Would have to be a man who has had business experience and is a good executive. Both the position and investment are attractive. Address Box R. N. 561, c/o Motor Age.

**WILL SELL ALL OR HALF OF THE BEST** equipped garage in the Middle West, located in the best city in Colorado. Have the agencies for the best line of cars on the market. Are well and permanently established and making money from a high-grade patronage. Personal reasons for selling not detrimental to business. Exceptional opportunity for parties in position to put up \$30,000.00. Present owner would contract to work for buyer if satisfactory and wanted. Ideal place to live, climate fine, and nothing wrong in any way for proper party. Address Box D-560, c/o Motor Age.

**WANTED GOOD LOCATION FOR GARAGE** in good southern or western town or city by good garage man from the North. Address Box D 570, c/o Motor Age.

### Batteries

**AMPVO STORAGE BATTERIES.**

Surplus stock, must be sold before January 1st. Special price for quick sale. Every battery guaranteed, 60 to 140 ampere. THE AMPVO BATTERY CO., 3031 Michigan Ave., Chicago, Ill.

### Tires

**BARGAINS IN NEW AND USED TIRES** Lowest prices in Chicago

All Standard Makes  
Send for Price List  
Serlin Tire Co.  
1073 14th Place, Chicago, Ill.

**I WILL SELL YOU CLINCHER OR** straight side tires, either firsts or seconds, cheaper than any one in the United States. D. Ogden, Columbus, Ind.

**ROCK BOTTOM PRICES** On Tires, Tubes and Reliners; new and used. Write for prices. ACME TIRE & REPAIR CO., 1547 Michigan Ave., Chicago. Phone Calumet 3127.

### TIRE OPPORTUNITIES

for Ford Owners

Your opportunity if you own a Ford, have salesman's ability, and live in a small town where we have no agency for

**STODDARD'S FORD TIRES**

Twenty-five per cent Heavier—Tougher—and Stronger Cases—and Heavy Red Tubes.

These tires make your car ride easier—give you more mileage, save too frequent blowouts and other tire trouble.

We make 30x3½ and 30x3 cases and tubes only—make them in large quantities from the best Para Rubber procurable and 400-lb. test fabric. But by eliminating detail expense necessary in factories where 104 different sizes and types are made we have reduced manufacturing costs and pass this saving along to our customers.

Wire or write nearest distributing branch or home office immediately for full information, prices and our agency proposition. You can save on your own tires—give your friends a better tire with more wear for the money, and make a good profit yourself.

**STODDARD TIRE SALES CO.**

Worcester, Mass.

New York: 524-526 West 34th St.

Chicago: 608 So. Dearborn St.  
Suite 513-522 Transportation Bldg.

**TIRE BILLS REDUCED!** Write for our prices on first and second tires. We guarantee to save you money. TIRE SALES COMPANY, 931 Main St., Buffalo, N. Y.

### Rebuilding and Repairing

**ANDRE G. CATELAIN** General Machine Work For Foreign and American Cars Welding all kinds of metal EVERREADY AUTOMATIC ENGINE STARTER SALES SERVICE. Manufacturer Catelain Hose Coupling. 1446-8 Indiana Ave. Tel. Calumet 1187 Chicago.

**AUTOMOBILE REPAIRING OF THE** highest class at prices that are fair to both parties, has made possible our reputation for reliability. Estimates cheerfully furnished. Barrett Automobile Repair, 150 E. Indiana St., Chicago. Phones, North 7571, Automatic 43-482.



**AUTOMOBILE CYLINDERS REGROUND,**  
new piston and rings fitted. Garage Air  
Compressors. Cast Iron Brazing Co., Man-  
chester, N. H.

**AUTO SPRINGS REPAIR CO.**  
We manufacture and repair springs. Proper  
action compound put in springs. 1331 Jack-  
son Blvd., Chicago, Ill.

**C. A. NEWTON'S FORD REPAIR SHOP—**  
Exclusive Ford Repairs.  
1505 So. Michigan Ave., Chicago, Ill.  
Phone Cal. 5246.

**CYLINDERS REGROUND AND FITTED**  
with new pistons and rings for \$7 to \$11 per  
cylinder. We do this class of work exclu-  
sively and are thus able to give you the high-  
est class of work at these prices. The Crown  
Machine Shop, Crown Point, Ind.

#### CYLINDERS REBORED & REGROUND

and fitted with my new light racing pis-  
tons, guaranteed to give 35% higher speed,  
power and economy. Also make gears of  
all kinds and push rods and piston pins of  
chrome nickel steel, hardened, tempered and  
ground, superior to factory; also cranks,  
connecting special motors; send parts to  
the shop of quality.

**MCCADDEN MACHINE WORKS,**

St. Cloud, Minn.

**CYLINDERS REGROUND**  
and fitted with new pistons and rings for \$15  
per cylinder. We make parts and cut gears  
of all kinds. Send us your old parts and we  
will repair or duplicate them in record time.  
Cracked cylinders, gear cases, etc., welded  
and made good as new. Aluminum, bronze  
and brass castings of every description. The  
Adapt Machinery Co., 1624 Wabash Ave.,  
Chicago, Ill.

**CYLINDERS REGROUND**  
And fitted with new pistons and rings.  
**EXPERT REPAIRING AND REBUILDING**  
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We guarantee all our work.  
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Pans and do guaranteed repair work. Prompt  
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send your Radiator down East when you can  
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Works rebuild and repair radiators, hoods,  
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We carry a complete stock of reground bearings of all makes and sizes, for immediate exchange.

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**All New 1913 Stock**  
Direct from leading tire manufacturers  
**WHILE THEY LAST**

Size.	Casing.	Tubing.	Reinforc.
28x3	\$ 7.20	\$1.90	\$1.80
30x3	7.65	1.95	1.90
32x3	7.80	2.05	1.95
30x3 1/2	11.00	2.70	2.65
32x3 1/2	12.00	2.90	2.85
33x4	15.70	3.60	3.50
34x4	16.00	3.70	3.55
34x4	17.25	3.80	3.90
35x4	17.50	3.90	3.95

C. O. D. orders sent same day as received upon receipt of 10%, subject to your examination.

## PARA AUTO TIRE CO.

Phone Calumet 2814  
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## FORD COUPES

Neat, attractive coupe and sedan bodies built especially for Ford cars. Write for price and design.

**PAUL MURRAY, Dealer in Automobile Bodies**  
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Michigan State Auto School,  
"The Old Reliable School,"  
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### AUTO BUSINESS

Quickly and thoroughly learned by our practical system. 3,100 graduates. Catalog D free at

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**LEARN TO EARN \$100 TO \$200 PER** month. Free booklet, "How To Succeed In the Automobile Business," on application. A Greer diploma guarantees efficiency and protects the life of your employer. Largest motor college in the world—1400 graduates—\$40,000 in modern equipment—eight instructors—100 rebuilding cars—actual work, repairing and driving. Day and evening classes—many owners and dealers employ Greer graduates only.

**GREER COLLEGE OF MOTORING**  
1456 Wabash Ave., Chicago (opp. Coliseum).  
Phone Calumet 327.

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This is your opportunity. Buy the best \$1800.00 car in the world. We are offering it for half price. Send for our illustrated circular giving full description.

This was a deal that may never be duplicated. Buy your new automobile now and save from \$500 to \$1000. In the Spring it will be too late.

Regal 40's, 5 and 7 passenger. We have only a very limited number of these famous cars left and are closing out the balance for \$885 complete. Special inducements on this car. Write for our selling plan.

For other bargains in New Runabout and Touring Cars, send for complete list. By arrangement with some manufacturers, we are restrained from publicly advertising the names of the new cars we are selling.

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We offer all new Standard lines at less than manufacturers' cost. These are a few of the greatest bargains in the world.

	Regular Our price	price
New Bodies 7 pass. leather trimmed..	\$400	\$125
5 pass. leather trimmed..	250	40
5 pass. leather trimmed..	250	60
4 pass. leather trimmed..	300	85
New Bodies Delivery wagons all sizes, \$40.00 to \$100.		
New Bodies Coupes, three models and sizes, \$275 to \$350.		
New Bodies Limousines, large assortment, \$400 to \$750.		

**TOPS**  
500 Silk Mohair tops, five and seven passenger, complete with curtains and boot \$25 each.  
300 silk mohair roadster tops \$15 each.

**WIND SHIELDS**  
2000 New Shields, all sizes and styles, \$5 to \$15 each.

### MOTORS

	Regular price	Our price
50 H.P. 6 cyl. Herhall Spillman...	\$650	\$275
40 H.P. 4 cyl. Herhall Spillman...	550	275
40 H.P. 4 cyl. Buda...	700	200
45 H.P. 3 cyl. Reliance...	400	95
25 H.P. 4 cyl. Poss...	400	140
35 H.P. 4 cyl. Atlas...	300	165
5 H.P. 1 cyl. Mecca...	100	30
Reverse gears, three sizes, \$12, \$19, \$38.		

### CARBURETORS

	Regular Price	Our Price
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1 1/4 Rayfield .....	45.00	12.50
1 1/4 Stromberg .....	45.00	12.50
1 1/4 Schebler Mod. O Mod. L	25.00	8.50
1 1/4 Kingston .....	18.00	5.00
1 Holly Ford Model.....	15.00	5.00
1 Kingston old style.....	15.00	1.50

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Splittorf Model X with coil, complete, \$22.50. These are only a few of our wonderful offerings. Send for our Price Wrecker today.

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We make the best radiators in the world. Our prices cannot be equalled. Every radiator is made to order. Delivery is guaranteed on all makes 48 hours after arrival of order. Buick 10 and Ford Models delivery same day as order is received.

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Ford N R S .....	26.00	31.00
Buick 10 .....	22.00	28.00
Buick 16 .....	37.00	30.00
Buick 17 .....	30.00	35.00
Chalmers 30 .....	30.00	35.00
Hudson 20 .....	28.00	35.00
Overland .....	35.00	40.00
Hupmobile .....	25.00	30.00
Cadillac, Large .....	45.00	50.00
Cadillac, Small .....	30.00	35.00
E. M. F. 30 .....	27.00	32.00
Brush .....	22.00	27.00
Regal 30 .....	35.00	40.00
Mitchell .....	35.00	40.00
Abbott 30 .....	30.00	35.00
Abbott 44 .....	40.00	45.00
Pierce Arrow .....		35.00
Lozier .....		30.00

## TIMES SQUARE AUTO CO.

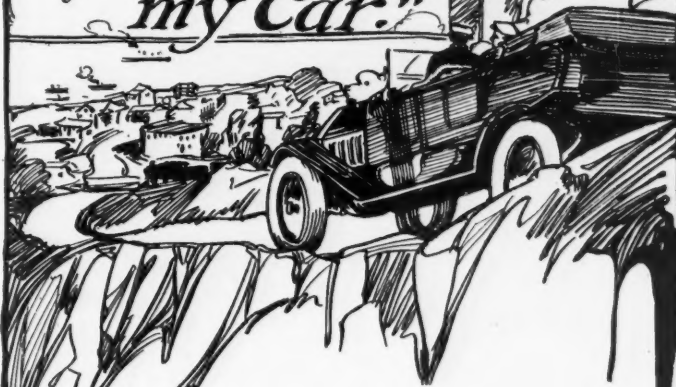
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**"Don't Worry!**  
*I've had*  
**ELEKTRA**  
*Brake Lining put on*  
*my Car."*



"I believe in trying a thing at least once. So I tried almost every kind of brake lining that was offered me. But after the hair-raising experiences I had when the brakes worked poorly—mostly because the lining was oil-soaked or burned—I went back to ELEKTRA, AND NOW I KNOW I'M SAFE."

These are the words of many a motorist about

## ELEKTRA Asbestos Friction Brake Lining

Down Devil's Gulch or up Jacob's Ladder it makes motoring safe. In crowded city traffic, ELEKTRA acts instantly. Road conditions do not affect it because it has a very high coefficient of friction and withstands extreme pressure.

ELEKTRA ASBESTOS BRAKE LINING cannot burn, char, slip or be affected by oils, water vapor, etc., for the reason that it is made of selected asbestos chemically combined, by a patented process, with an indestructible metal.

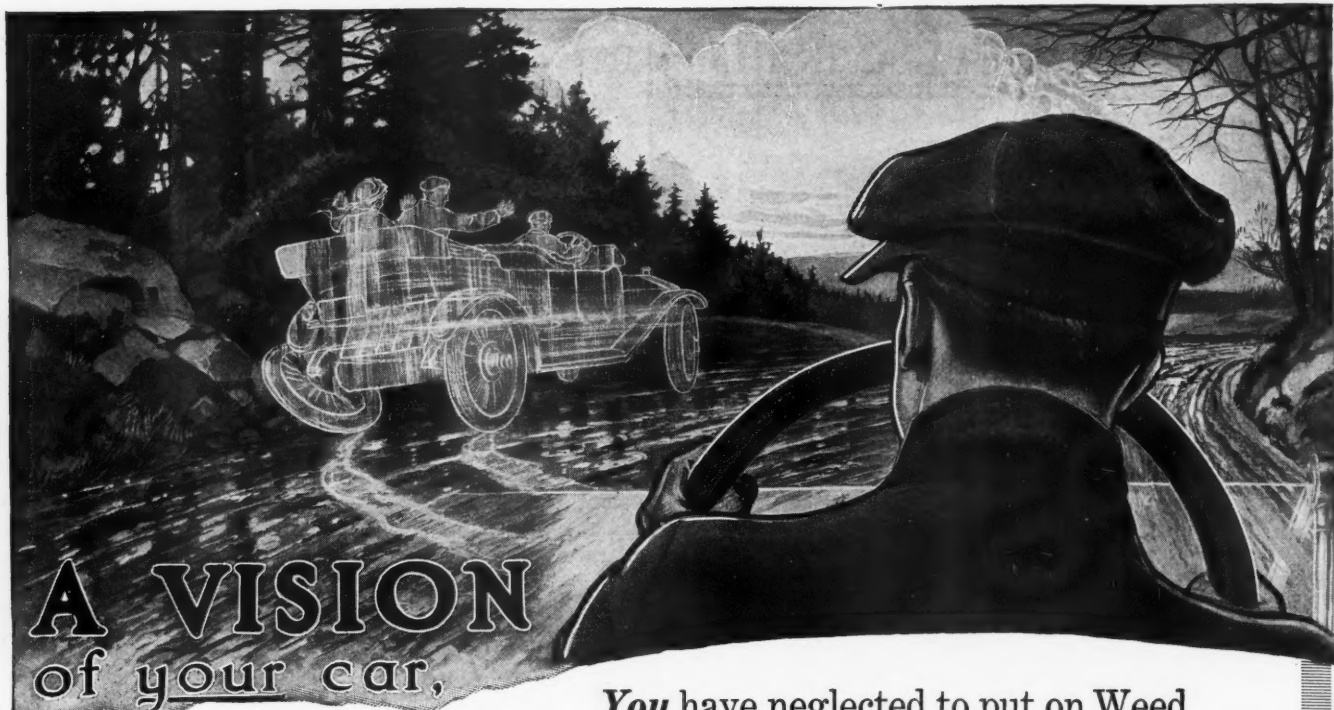
ELEKTRA gives better wear and longer service than any other facing. But convince yourself.

A sample—together with complete information—is yours for the asking.

Write for both.

**THE F. L. HORTON MFG. CO.**  
 Whittier Street  
 BOSTON, MASS.





**A VISION**  
of your car,  
smashed on the  
slippery curve  
ahead—

*You* have neglected to put on Weed  
Chains.

*You* anxiously view the slippery  
curve ahead and have *a mental*  
*picture of your car smashed against a rock.*

Why nurse anxiety and coax calamity—why take such  
chances when you know

## Weed Anti-Skid Chains

*Absolutely Prevent Skidding*

*No other device* has ever been in-  
vented that takes the place of Weed  
Chains. All kinds of "make-shifts"  
have been tried—useless and worth-  
less all. The *real value* of Weed  
Chains has been proven so often and  
so satisfactorily during the last ten  
years that there is no room for ar-  
gument. They are slipped on in

a moment without a jack. *They*  
*don't injure tires* even as much as  
one little slip or skid. *They never*  
*fail* in an emergency  
and take up hardly any  
space when not in use.  
*Send for Booklet proving the*  
*efficiency, economy and nec-*  
*essity of Weed Chains.*

*Sold for ALL Tires by Dealers Everywhere*

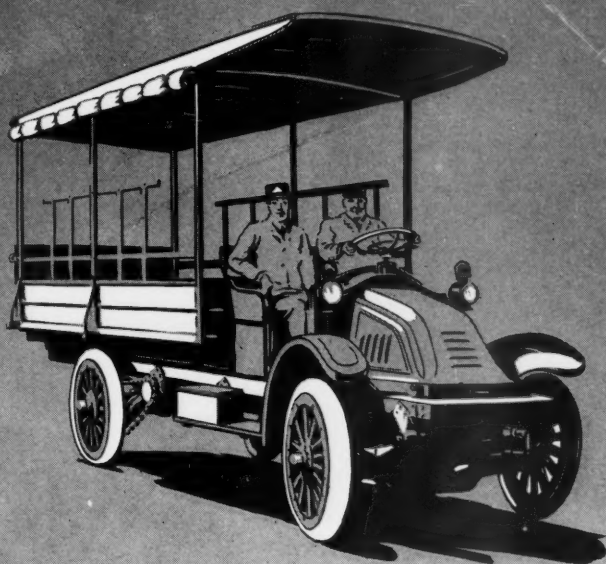
**Weed Chain Tire Grip Co.,**  
28 Moore Street - - - NEW YORK

*Manufactured for Canada by*

*Dominion Chain Co., Limited—Head Office: Shaughnessy Bldg., Montreal, Can.*



*When Writing to Advertisers, Please Mention Motor Age.*



Make Trucks  
Pay—Use

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FRICION REDUCING MOTOR OIL

Keep them busy, and properly LUBRICATED.

Polarine is made in ONE GRADE that lubricates **every type** of motor in every kind of car or truck.

**It maintains the correct lubricating body at any motor speed or heat, and flows perfectly in zero weather.**

It keeps every friction point protected with a durable slippery film. Millions of parts have run for years on Polarine practically without wear.

The World's Oil Specialists make it after 50 years' experience with every kind of lubricating problem and a study of all makes and types of cars.

Polarine is worth to you **many times its cost**, because it stops the **largest** part of **motor truck depreciation**. Try it for three months and note the saving in repairs.

**STANDARD OIL COMPANY**

(AN INDIANA CORPORATION)

*Makers of Special Lubricating Oils for Leading Engineering  
and Industrial Works of the World*



WHICH TWO OF THESE FOUR BOOKS  
SHALL WE SEND YOU?



The beautiful 48-page book shown at the top, "Maxwell Factories & Facilities," contains more than 175 views of as many processes of automobile manufacturing; tells and shows you more about this interesting subject than, perhaps, you've known before. The others describe the three Maxwell models —The "25," at \$750; the "35," at \$1225; and the "50-6," at \$1975. By mail, prepaid, for the asking.

**Maxwell Motor Company, Incorporated**  
Department C , Detroit, Michigan